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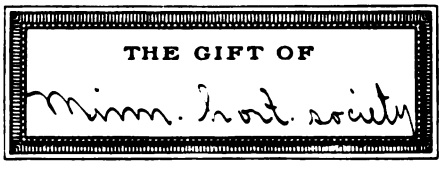
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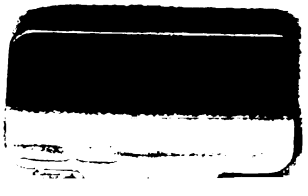

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A. W. Pendergast.

HUTCHINSON, MINN.

President of the Minnesota State Horticultural Society.

(For Biography see index.)

Trees, Fruits and Flowers

OF

MINNESOTA.

1899.

EMBRACING THE TRANSACTIONS OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FROM DECEMBER 1, 1898, TO DECEMBER 1, 1899,
INCLUDING THE
TWELVE NUMBERS OF "THE MINNESOTA HORTICULTURIST"
FOR 1899.

EDITED BY THE SECRETARY,

A. W. LATHAM,

OFFICE AND LIBRARY, 207 KASOTA BLOCK,

MINNEAPOLIS, MINN.

Official Stenographer, A. G. LONG, Excelsior, Minn.

VOL. XXVII.

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1899.

THE MINNESOTA HORTICULTURIST.

VOL. 27. JANUARY, 1899. No. 1.

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OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY FOR 1899.

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S. D. RICHARDSON, Second " " ....Winnebago City
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SUPERINTENDENTS OF TRIAL STATIONS.
1899.

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E. H. S. DARTT ..... Owatonna
DEWAIN COOK ..... Windom
CLARENCE WEDGE ..... Albert Lea
CHAS. W. SAMPSON (grapes) ..... Eureka
O M. LORD (plums and small fruits) ..... Minnesota City
H. M. LYMAN (apples) ..... Excelsior
J. S. HARRIS ..... La Crescent
L. R. MOYER ..... Montevideo
MRS. JENNIE STAGER ..... Sauk Rapids
WILLIAM SOMERVILLE ..... Viola

COMMITTEES FOR 1899.

FRUIT LIST.

Clarence Wedge ..... Albert Lea
J. P. Andrews ..... Faribault
Prof. S. B. Green ..... St. Anthony Park

SEEDLING FRUITS.

J. S. Harris ..... La Crescent

ORNAMENTAL LIST.

F. H. Nutter ..... Sykes Block, Minneapolis
L. R. Moyer ..... Montevideo
Fred Nussbaumer ..... St. Paul

NOMENCLATURE AND CATALOGUE.

J. S. Harris ..... La Crescent
Prof. S. B. Green ..... St. Anthony Park

LEGISLATURE.

Wyman Elliot ..... Minneapolis
J. M. Underwood ..... Lake City
D. R. McGinnis ..... St. Paul
J. S. Harris ..... La Crescent
Prof. W. M. Hays ..... St. Anthony Park
A. W. Latham ..... Minneapolis

PUBLICATION.

Prof. S. B. Green ..... St. Anthony Park
Wyman Elliot ..... Minneapolis
A. W. Latham ..... Minneapolis

CONSTITUTION OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

ADOPTED JAN. 9, 1895. AMENDED JAN. 7, AND 9, 1898.

ARTICLE I.—Name.—This society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.—Its object.—The object of this society shall be the advancement of the art and science of horticulture throughout the state.

ARTICLE III.—Membership.—Any person may become an annual member by paying to the secretary an annual fee of $1.00, or a life member by the payment of $10 00, provided that the life fee may be paid in two annual payments of $5.00 each. The members of any local horticultural society, the annual fee of which is not less than $1.00, may become annual members of this society, provided such local society shall send to the annual meeting of this society a duly authorized delegate, and shall transmit to the secretary a properly certified list of its members, an annual report of its proceedings, together with the papers read at its meetings, and an annual fee of twenty-five cents for each member of such local society.

All memberships shall expire at the close of the first day of the next annual meeting. Honorary members for the time stated, or for life, may be elected at any annual meeting by a two-thirds vote of the members present, provided that the name proposed for this purpose shall be first referred to the executive board. Every member shall be entitled to one copy of the transactions, postpaid, as often as published.

No member shall vote at any election of officers except those who have been members for not less than two consecutive years immediately preceding that in which the election is being held.

ARTICLE IV.—Officers.—Its officers shall consist of a president, one vice-president from each congressional district, a secretary, a treasurer, a librarian and an executive board of six. All officers shall be elected separately and by ballot cast personally by the membership, and shall hold office until their successors are elected and qualified, except that the vice-presidents may be elected by the secretary casting therefor the ballot of the society. The annual election of officers shall take place on the afternoon of the third day of the annual meeting. All terms of office shall begin immediately upon election, and no person shall be eligible to hold office who has not been a member of the society for the three years immediately preceding. The president, vice presidents and the treasurer shall hold their offices for one year. An executive board to consist of six

members shall be elected at the first election after the adoption of this constitution. The first two members elected shall hold their office for a term of three years, the next two members shall hold their office for a term of two years, and the last two shall hold their office for a term of one year, and at each annual election thereafter two members of this board shall be elected to serve for a term of three years. The president and secretary of this society shall be *ex-officio* members of the executive board. The secretary shall be elected by the executive board at its first session after the close of the annual meeting, and hold his office for one year.

ARTICLE V.—The President.—The president shall call and preside at all meetings of the society and, under the direction of the executive board, have a general superintendence of its affairs. In the absence or disability of the president, the executive board shall select one of the vice-presidents to act as president pro tempore.

ARTICLE VI.—The Vice-Presidents.—The vice-presidents shall have the general supervision of all horticultural interests in their respective districts, and as such constitute a general fruit committee, and make a report to the society at its annual winter meeting and recommend a list of fruits succeeding best in their districts. In consideration therefor the society shall pay the traveling expenses incurred in their attendance at said meeting.

ARTICLE VII.—The Secretary.—The secretary shall keep a full record of the proceedings of the society and of the executive board. He shall receive and pay over all moneys collected from members, or otherwise, to the treasurer, taking his receipt therefor. He shall, under the direction of the executive board, conduct the correspondence of the society, have charge of its books and papers, prepare its reports for publication and attend to their distribution. He shall be *ex-officio* librarian of the society. He shall receive for the necessary expenses of reporting the meetings, postage, stationery, printing, office rent, assistance, salary, etc., such sums as the executive board may vote therefor. He shall make a report of the work of his office at each annual meeting.

ARTICLE VIII.—The Treasurer.—The treasurer shall receive and hold all funds of the society, and pay out the same only upon the order of the president, countersigned by the secretary. He shall give such bond as the executive board may direct, to be approved by the president and filed with the secretary. He shall make a report of all receipts and disbursements of his office at the annual meeting, and at any other time when called upon to do so by the executive board.

ARTICLE IX.—The Librarian.—The librarian shall have charge of the library and report its condition at the annual meeting.

ARTICLE X.—The Executive Board.—The executive board shall, at their first meeting after the annual election, elect one of their members chairman, who shall call and preside at all meetings of the board and, as such officer, endorse all bills audited by the board. They shall have general charge of the affairs of the society, and make a report in detail at each annual winter meeting. They may call a meeting of the society at any time they deem advisable, giv-

ing at least fifteen days notice through the monthly publication of the society or by mail service on the members. It shall be their duty to audit all bills before they shall be ordered paid by the president and secretary. They shall prepare a program for each regular meeting of the society, to be issued at least two weeks before the date of such meeting. They shall appoint annual committees on fruit list, seedlings, nomenclature, small fruits, apples, vegetables, flowers and such other subjects as they deem best. They shall fill all vacancies occurring in the offices of the society by appointment, to hold good until the next annual election. They shall have full care and disposal of all funds in the treasury of the society, and shall expend the same in such manner as in their judgment shall best promote the interests of horticulture in the state. They shall serve without compensation, but be entitled to their expenses in attendance at the meetings of the board or society.

A meeting of the executive board may be called by the chairman at any time he sees fit or upon the written request of any two members of said board, due notice being given either in person or through the mail to each member thereof. A majority of the board shall constitute a quorum for the transaction of business.

ARTICLE XI.—Meetings.—The society shall hold two regular meetings, annually, one commencing on the first Tuesday in December, to be called the annual meeting, and the other in summer at such time and place as the executive board may direct.

ARTICLE XII.—Quorum.—Ten members shall constitute a quorum at any meeting of the society.

ARTICLE XIII.—Amendments.—Amendments to the constitution or by-laws may be enacted by a vote of two-thirds of the members present and voting at any annual meeting, on two days notice of said amendment being given in writing.

FRUIT LIST, 1899.

FOR THE GUIDANCE OF PLANTERS IN MINNESOTA.

Adopted by the Minnesota State Horticultural Society, December 8, 1898.

APPLES.

Of the first degree of hardiness for planting in Minnesota: DUCHESS, HIBERNAL, CHARLAMOFF *(a)*.

Of the second degree of hardiness: Wealthy *(b)*, Longfield *(b)*, *(d)*, Tetofsky, Malinda *(b)* *(c)*.

Promising varieties for trial: Patten, Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet *(c)*, Kaump *(d)*, Gilbert, Brett, Christmas *(c)*, Blushed Calville, Cross 413, White Pigeon *(d)*.

CRABS AND HYBRIDS.

Best for general cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota *(c)*, Sweet Russet, Gideon's No. 6, Briar's Sweet, Tonka.

Promising varieties for trial: Dartt, Greenwood, Pride of Minneapolis, Crampton's No. 3, Lyman's Prolific, Faribault.

PLUMS.

Best for general cultivation: Desoto, Forest Garden, Weaver' Cheney, Wolf, Rollingstone, Wyant.

Most promising varieties for trial: Rockford, Ocheeda, New Ulm, Stoddard, Surprise, Mankato, Aitkin.

GRAPES.

Concord, Delaware, Moore's Early, Worden, Agawam, Brighton, Janesville *(e)*.

RASPBERRIES.

Red varieties: Marlborough, Turner, Cuthbert, Brandywine, Loudon.

Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Schaffer, Older, Souhegan, Columbian.

BLACKBERRIES.

Ancient Briton, Snyder, Badger.

CURRANTS.

Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.

GOOSEBERRIES.

Houghton, Downing. Varieties for trial: Red Jacket, Triumph, Pearl.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Capt. Jack, Wilson, Enhance, Lovett, Splendid.

NATIVE FRUITS.

Valuable for trial: Dwarf Juneberry, Sand Cherry.

(a) Peterson's Charlamoff.—There are two distinct kinds under this name; the one referred to is of spreading growth and bears conical shaped fruit.

(b) Does best top-worked.

(c) Tardy bearer. (d) Early bearer. (e) For severe situations.

ANNUAL MEETING, 1898, MINNESOTA STATE HORTICULTURAL SOCIETY.

A. W. LATHAM, SEC'Y.

The thirty-second annual gathering of this society was held from December 6-9, inclusive, in the same rooms in the Minneapolis Court-House in which we have been so comfortably accommodated for a number of years previous. Arrangements were made whereby a small room adjoining was fitted up as a cloak room, which proved to be of great convenience and was highly appreciated by all. This gave us more space for the fruit exhibit, which was then easily accommodated in the two rooms adjoining the audience room. The attendance was excellent, being fully up to any preceding year, and there were an unusual number of prominent horticulturists with us as delegates from neighboring states. Prof. N. E. Hansen, horticulturist at the South Dakota Agricultural College, represented his state society; Elmer Reeves, a nurseryman from Waverly, Iowa, represented the Iowa society; and we were favored also with the presence of Charles F. Gardner, of Osage, Iowa, president of the Iowa state society, and the well known horticulturist, Mr. Edson Gaylord, from Nora Springs, of the same state. The Wisconsin society was well represented by Secretary A. J. Philips and A. D. (Apple-tree) Barnes, a prominent fruit grower and nurseryman of Waupaca. Even far away Illinois put in an appearance in the person of J. L. Hartwell, president of the Northern Illinois society. These gentlemen were all horticultural experts and added greatly to the interest of the meeting.

There were from our own state an unusual number of those in attendance who have never met with us before. The leaven is working among the newer members of our association, who are numbered by the hundreds, and we may expect many such to meet with us on future occasions. With few exceptions, the older members of the society were present. We missed, especially, a regular attendant, Mr. O. M. Lord, who is now with the institute corps, and Mr. F. W. Kimball, who has rarely failed of being with us of late years. The decease of Messrs. J. O. Barrett, J. A. Sampson and Andrew Peterson, who have been very regular attendants at our meetings, created a break in the ranks which was sadly noticeable.

The exhibit of fruit, mainly apples—although there were thirty or forty plates of fine grapes—occupied the same space as the year before. There were 198 entries, and the amount of premiums awarded was $132.50. A full list of the awards will be found on another page of this number. A large share of the fruit had been kept in cold storage, so that many summer varieties were shown, but there were also a goodly sprinkling of kinds that had been preserved in the cellar. Of apple seedlings not kept in the cellar, there were nigh a dozen exhibited. Mr. Ditus Day received first premium on this and the Jewell Nursery Company second.

The program, which contained something over 110 numbers as arranged, was very fully carried out and without any noticeable disarrangement. Very few of the speakers failed in attendance,

and the time was fully and profitably occupied with papers and discussions.

On the second day of the meeting, Wednesday, a change was made in the constitution, notice of which had been given the last day of the session of the previous year. This provided that the voters at the annual election of officers must be then in their third year of membership. There was practically no opposition to this change, and it will go far towards insuring a fixed policy in the affairs of the society, as those voting will be only such as are permanently interested in its work.

The annual election, which took place Thursday, was something of a contrast to that of a year ago in that there was, in no case, more than one nominee for any of the offices to be filled. The retiring president, Mr. J. M. Underwood, who has filled this position six years with such signal success, nominated Prof. W. W. Pendergast as his successor, and he was promptly elected. The only other changes from the previous officers were in the vice-presidency of the first congressional district, Mr. F. W. Kimball, of Austin, having been nominated by the retiring vice-president, Mr. E. H. S. Dartt, of Owatonna, and Mr. D. T. Wheaton, of Morris, who was elected to fill the vacancy in the seventh district caused by the death of Mr. J. O. Barrett.

On the last day of the meeting a further change was made in the constitution, the purport of which is to reduce to twenty-five cents the fee which members of local societies must pay to become members of the state society. The constitution as amended at this meeting will be found in full in this number.

A number of resolutions were adopted during the meeting. One urged the state legislature to make an appropriation of $35,000 for the construction of a building for horticulture and botany at the state agricultural college. Another offered thanks to Mr. J. W. Thomas for the $100 sweepstakes premium on fruit, offered by him at the state fair.

Action was taken in reference to three matters of much importance to the association, and equally so to the public at large. The first was in regard to the appointing a committee to inquire into the matter of securing permanent rooms for the society in the new state capitol. After a spirited discussion in regard to a resolution looking to the preparation and passage of a San José scale bill for the coming legislature, the president was authorized to appoint a committee to draft a bill, the title of which is to read, "A bill to regulate and control the sale of nursery stock in the state." The president in his annual address suggested the offering by the society of a $1,000 for a seedling apple tree, which should be as handsome and of as good quality and as good a bearer as the Wealthy, as hardy as the Duchess, and as long-keeping as the Malinda. Although not the exact wording of the resoluion, this is the purport of it. This proposition was enthusiastically received by the meeting, and it was decided unanimously to offer this amount as a premium. The matter was placed in the hands of the executive board to formulate a plan and carry it out.

The session closed on Friday evening with an entertainment by the agricultural school, under the management of Prof. Green. It is needless to say that this was a success, and it was found neeessary to move into a larger room to accommodate the crowd. Music by the school band and orchestra, interesting papers, dumb bell and Indian club exercises, a couple of rollicking songs by President Underwood, and the annual lantern show by the professor completed, as the members say, "the most interesting session we have ever held." A pleasant feature of the evening was the action of the society in making Mr. J. C. Kramer, of La Crescent, a life member. His lifetime of service in horticulture and long connection with the society were well worth the compliment.

AWARD OF PREMIUMS.

At the Annual Meeting, 1898, of the Minnesota State Horticultural Society.

APPLES.

Article.	Exhibitor.	Premium.	Amount.
Walbridge	Wm. Oxford, Freeburg	First	$ .75
Ben Davis	"	First	.75
Sweet Winter	"	First	.75
Golden Russet	"	First	.75
Tetofsky	"	Second	.50
Pewaukee	"	First	.75
Sweet Russet	Ditus Day, Farmington	First	.75
Tallman Sweet	"	Second	.50
Haas	"	Second	.50
Fameuse	"	First	.75
Collection of seedlings	"	Second	3.00
Seedling, not in cold storage	"	First	4.00
Malinda	"	First	.75
Minnesota	J.A. Howard, Hammond	Second	.50
Hibernal	"	Second	.50
McMahon	"	First	.75
Peach	"	First	.75
Giant Swaar	"	First	.75
Brett	"	Second	.50
Beecher's Sweet	"	First	.75
Powers	"	First	.75
Early Strawberry	"	Second	.50
Collection	"	Third	3.00
Collection	W. L. Parker, Farmington	Second	5.00
Gideon, No. 6	"	First	.75
Martha	"	First	.75
Whitney	"	Second	.50
Dartt	"	Second	.50
Hyslop	"	First	.75
Transcendent	"	Second	.50
Florence	"	First	.75
Minnesota	"	First	.75
Hibernal	"	First	.75
Antonovka	"	First	.75
Rollin's Prolific	"	First	.75
Rollin's Pippin	"	First	.75
Okabena	"	Second	.50
Tallman Sweet	"	First	.75

Article.	Exhibitor.	Premium.	Amount.
Brett	W. L. Parker, Farmington	First	.75
Patten's Greening	"	First	.75
Haas	"	First	.75
Utter	"	Second	.50
Cross	"	First	.75
Charlamoff	"	First	.75
Tetobsky	"	First	.75
Borovinka	"	First	.75
McMahon White	"	Second	.50
Lubsk Queen	"	First	.75
Wealthy	T. Redpath, Long Lake	First	.75
Walbridge	J. S. Harris, La Crescent	Second	.50
Utter	"	First	.75
Golden Russet	"	Second	.50
Fameuse	"	Second	.50
Perry Russet	"	First	.75
Scott's Winter	"	First	.75
Repka Malenka	"	Second	.50
Duchess	W. L. Parker, Farmington	Second	.50
Virginia	"	First	.75
Seedling, in cold storage	"	First	2.00
Lieby	Wm Somerville, Viola	First	.75
Red Queen	"	First	.75
Peerless	O. Wedge, Albert Lea	Second	.50
Repka Malenka	"	First	.75
Ostrekoff	"	First	.75
Malinda	"	Second	.50
Cross	"	Second	.50
Longfield	"	First	.75
Peerless	T. Redpath, Long Lake	First	.75
Collection	Jewell Nursery Company	First	8.00
Seedling, not in cold storage	"	Second	2.00
Wealthy	"	Second	.50
Duchess	"	First	.75
Okabena	"	First	.75
Borovinka	"	Second	.50
Longfield	"	Second	.50
Northwestern Greening	"	First	.75
Wolf River	"	First	.75
Patten's Greening	"	Second	.50
Antonovka	"	Second	.50
Anisim	"	First	.75
Martha	"	Second	.50
Early Strawberry	"	First	.75
Pride of Minneapolis	"	First	.75
Dartt	"	First	.75
Whitney	"	First	.75
Transcendent	"	First	.75
Hyslop	J. R. Cummins, Eden Prairie	Second	.50
Yellow Transparent	D. F. Akin, Farmington	First	.75
Collection of seedlings	"	First	5.00
Seedling, in cold storage	"	Second	1.00

Mr. H. L. Crane, of Excelsior, had on exhibition a fine lot of seedlings with good color, and J. H. White's, of Crystal, No. 2 deserves mention as a valuable variety.

There were several seedlings of Iowa apples, exhibited by Mr C. G. Patten, which attracted attention.

CHARLES F. GARDNER, Judge.

GRAPES.

Article.	Exhibitor.	Premium.	Amount.
Brighton	Gust Johnson, Excelsior	First	$ .75
Lindley	"	Second	.50
Pocklington	"	First	.75
Moore's Early	"	First	.75
Concord	"	Second	.50
Wyoming Red	"	First	.75
Niagara	"	First	.75
Worden	"	First	.75
Duchess	"	First	.75
Collection	"	First	3.00
Collection	H. L. Crane, Excelsior	Second	2.00
Delaware	"	Second	.50
Iona	"	First	.75
Lindley	"	First	.75
Concord	"	First	.75
Delaware	J. R. Cummins, Eden Prairie	First	.75
Worden	"	Second	.50
Brighton	"	Second	.50
Wyoming Red	"	Second	.50
Agawam	"	First	.75
Massasoit	"	First	.75

A. D. LEACH, Judge.

FLOWERS.

Collection of plants	E. Nagel, Minneapolis	First	5.00
Single Rose	"	First	1.00
Single Geranium	"	First	1.00
Single Begonia	"	First	1.00
Single Carnation	"	First	1.00
Collection of Cut Roses	"	First	2.00
Collection of Cut Carnations	"	First	2.00
Table Bouquet	"	First	2.00

(MRS.) JENNIE STAGER, Judge.

HONEY.

Extracted Honey	H. L. F. Witte, Minneapolis	Second	2.00
Extracted Honey	Fr. Moeser, Minneapolis	First	3.00
Comb Honey	"	Second	3.00
Comb Honey	E. K. Jaques Crystal	First	5.00

J. A. HOWARD, Judge.

Officers' Annual Reports.
1898.

PRESIDENT'S ANNUAL ADDRESS.

J. M. UNDERWOOD, LAKE CITY.

Members of the Minnesota State Horticultural Society:—

The rapid development of all the material resources of our country during the past ten years has been shared in a marked degree by the horticultural interests of our state. The forces of improvement and progress permeate the air, and out of the dark clouds of seeming failures and reverses that hung over the fruit interests of Minnesota in its infancy, has burst the morning sunshine of success. The tottering limbs of our horticultural infant have strengthened, and it now stands on an intelligent and firm foundation. Its periodical attacks of colic, accompanied by a panic among its anxious guardians, are now but memories, and at the annual gatherings its windy cries of trouble are heard no more; but sunny smiles wreath its face instead, and ripples of joy and glee bubble up and flow from the well-spring of its heart, shedding its influence far and wide throughout the state.

There are some planters among us who have often declared that our best varieties of apples were failures, but they are now forced to abandon that position by the abundant returns that they themselves are receiving from those very varieties, while the persistent and vigilant enthusiasts who, through their determination to succeed earned the worthy title of "cranks," and are now reaping a rich reward.

Horticulturists, as a rule, are the most persistent, indomitable class of people engaged in the struggle of developing the hidden resources of nature. Reverses act as a stimulus to them, quickening their efforts and strengthening their determination to persevere until success is achieved. They deem no sacrifice too great that will demonstrate the worthiness of a variety of fruit, and they are firm in unfaltering reliance upon what the future may have in store for them.

The past thirty years of experience with the pioneers of horticulture form an unwritten history that is full of practical lessons, drawn alike from failures and successes. Year by year we have come together for counsel and advice, which have been freely given and gladly received. It is true that we have occasionally become over-zealous in advocating our pet theories, which we firmly believed would revolutionize all other methods of fruit raising, and most of us have experienced a fall from some dizzy height or hobby. Still, ludicrous blunders will oftimes point a lesson that will prove of inestimable value.

Orchard and garden have been the school-room where lessons have been prepared, sometimes at great expenditure of time and means. The problems therein found have been so difficult to solve that often the temptation would come to give up the task. At the annual meetings, all have gathered to give the results of their labors, and many differing answers have been given; but all have profited by the lessons learned.

The value of such an organization as our horticultural society is simply marvelous, when considered from a utilitarian point of view. Through its efforts, health, wealth, comfort and happiness have been spread throughout the state. What more could be expected or desired of it?

We never could have accomplished so much without this parent tree upon which the fruit of our experience could develop. Individual efforts alone would have been slow in results, if not an entire failure; but with this society to centralize effort, to encourage systematic investigation, to distribute information freely, it is self-evident that the experimental period of fruit culture is past; all that remains now to be done is to develop the resources at hand, also to help and encourage others to profit by the knowledge we have gained in the past. The field is boundless in which to work. The practical questions, "How to improve different kinds of fruits and vegetables," "How to protect the home and orchard from the hot winds of summer and the cold blasts of winter," "How to make horticulture profitable," will ever be propounded with ever varying answers, gained by continuous experience.

There is also the ornamental side with its pertinent topics for consideration, such as, "The development of the artistic characteristics of each farm home," "The tasteful arrangement of lawns," "The care of garden and roadside," "The protection and propagation of the beautiful wild shrubs and flowers of Minnesota," "The preservation of the state forests and the stimulation of tree planting upon the prairies." All of these and kindred subjects are of vital importance to Minnesota, and the horticultural society has constituted itself the faithful mentor who will carefully guard and further whatever is essential to her welfare along lines within its control. As a result of this watchful care Minnesota will develop a superior class of intelligent citizens, which will be evidenced by the abundance of fruits, vegetables and flowers, shade and ornamental trees, surrounding every home, from the cabin of the humblest peasant to the well appointed palace of the millionaire.

The society's work in the past has resembled, somewhat, that of a pioneer missionary. With nothing it could call its own of this world's goods, with a spirit of unselfishness that was willing to sacrifice time and strength, with persistent fearlessness treading unknown forests and prairies, it has blazed paths that others might follow. Contact with the well known mercurial temperament of Minnesota herself has occasionally given rise to a discoloration of its visual organ, that is generally looked upon with disfavor; but, like the missionary, it had to get acquainted, and a playful ebullition of spirit was not deemed discouraging, but simply as a display of

misplaced energy. Acquaintance has deepened into friendship, the heart of the people has been reached, and the state at large recognizes the self-sacrificing thoughtfulness and effort of the horticultural missionary.

The object accomplished of awakening the horticultural life of the community, the society feels that, with added years and growing membership, a well earned reputation at home, as well as abroad, entitles it to the deserved privilege of retiring from the itinerant fraternity. In other words, our society needs a home, and it is now our bounden duty to provide a permanent place where its records may be kept, and where its accumulating library may be stored. Above all, it needs suitable rooms where its annual meetings can be held. Ample accommodations can now be arranged for in the new state capitol, and by taking advantage of them, the twentieth century will find the society in a home that will reflect credit on the forethought and wisdom of those who provided for it. We have been without a home for thirty-two years, and it is none too soon to agree upon the plans for one. Steadily increasing in number, we must prepare for the accessions of the future. The increasing membership, thus far, is a tribute to the work accomplished and to the knowledge that has been disseminated through our magazines and annual reports.

We confidently expect an increase of membership and valuable assistance from a reliable source, the State Farm School. Under the efficient direction of its faculty, intelligence in the work of the students is very noticeable, and their young, healthy blood will impart new vigor to horticulture. With its intelligent corps of instructors and the practical knowledge they impart, our State Farm School is, indeed, an institution in which to feel a just pride. The beautiful location, with its fine buildings and splendid equipment commend it to the attention of young men and women who desire to avail themselves of its many advantages as the best educational institution that the country affords. The modern and improved methods taught there will exalt farming above all other vocations upon earth.

And now the Woman's Auxiliary of the society is asking for recognition and offering its assistance. What an opportunity it is for us, and who are so well fitted to give counsel in adorning the home? Woman, as queen of the heart, ever loyal in thought and action to home-making, possesses the keen, discriminating faculty that enables her, with simple, homely resources, to convert a home into a veritable paradise. More may be expected when she widens her field of action and concentrates her latent power upon out-of-door improvement and adornment. She will call to her aid an invincible phalanx of life and beauty that awaits her command. The flowers all know her as a friend and will spring into new life at her bidding.

The vast resources of Minnesota are constantly attracting new settlers within her borders. They must be taught the best methods of horticulture, together with all its possibilities, and that for protection and comfort the prairie home should be surrounded with

living shelter belts, and they should be instructed in the best method of caring for them intelligently. They should be made to understand the value of forests to the country at large and to keep alive the sentiment that is striving so hard to arrest their devastation by the woodman's ax and the relentless fire. We, as a society, should encourage the study and discussion of economic forestry. A subject of such widespread interest, and one that affects the well-being of our state, should form a feature in public school work, in cities as well as in the country.

One thing of great importance to our state and to our interests as a society, is to secure the introduction of a first-class late-keeping variety of apple; and our society could not do a better thing than to offer a premium of a $1000 for an apple as good as the Wealthy in size, quality and appearance, that will keep as well as the Malinda and is as hardy and prolific as the Duchess.

If, as a society, we would continue to be useful, we must be alert to develop and promote those features of our work that the times and conditions indicate are most needed. We must thoroughly cultivate those principles of unselfish devotion to our beloved calling that will prompt us to work in harmony for the advancement of horticulture in this great northwest.

ANNUAL REPORT OF THE EXECUTIVE BOARD.

WYMAN ELLIOT, CHAIRMAN.

Mr. President, Ladies and Gentlemen:—Our executive board has had a very harmonious and pleasant year the past year. We have managed our work in such a way that it was necessary to hold only four committee meetings. It has been done partly by correspondence, thus saving to the society the expense of getting the committee together from different portions of the state. We have endeavored to take up the work in the line of horticulture and push it through in the way we thought was best for the interests of our society and the people of our state. We have had charge of the exhibitions of fruit that have been made by the society. Our summer exhibition was a magnificent effort. We had the finest display of small fruit that was ever made in the state. You are all familiar with what was done by our society at our state fair. Last year we had 2,700 plates of all kinds of fruit, and this year we had 5,400 plates. If we go on in this ratio we shall have to have a larger building for this purpose. We commenced in the early years, when we first made these exhibitions, with one little section in one corner of the building, and we had that very sparsely filled, and we have been increasing from year to year until we now occupy the whole building. We look forward to the coming year with great hopes. I think the people of our state can appreciate the efforts this society has made in the direction of horticulture.

I do not wish to take the time allotted to other topics that are to be presented here, but I could go on and tell you of many other things

the executive committee has done, but I think it is best that I do not disclose all that has been done the past year. I thank you.

Mr. Barnes, (Wis.): Did this society show the 5,400 plates asa society?

Mr. Eiliot: Not as a society, but it was by the membership, the people of the state.

The President.: I will explain for the benefit of the delegates present that the executive board forms the working force of the society. It would be impossible to bring the society together at various times during the year when it is necessary to do certain work, so it is delegated to the executive board. We have only two annual meetings—the summer and winter meetings—when the society as a whole has an opportunity to take part in the work, and in the interim the executive board does the work required.

On motion of Mr. Dartt the report of the executive board was adopted and a vote of thanks tendered the officers for the very able and efficient manner in which they have performed their various duties during the past year.

SECRETARY'S ANNUAL REPORT FOR 1898.

A. W. LATHAM, SEC'Y.

Members of the Minnesota State Horticultural Society:—

I do not intend at this time to burden you with a long statistical report of the status and doings of our society, but only in a general way to point out a few of the more prominent landmarks in our work.

The year just closing has been one of much prosperity for our society; indeed, I may properly say, has been the most prosperous one we have known. With our bills all paid and a respectable balance in the treasury, with a large and valuable addition to our library, with the credit of such an extraordinary exhibition at the state fair, with an annual membership roll larger than ever before, and larger, I may safely say, than that of any other similar organization in our country, with a steadily growing life roll, I don't know but we have some right to stand off at a little distance and smile at ourselves and be reasonably glad. With these growing facilities and these patent results, affecting the society itself, comes also, and the writer believes in a still larger degree, the growth of the objects for which alone the society exists. The leaven of horticulture, true and good, planted and nourished by this society, is surely at work, and its results are easily apparent in our midst. But are we satisfied with this? No. Our aspiration is as wide as the state itself, and includes every person within its borders. There is yet, and ever will be, the old problem to solve: How shall we reach all who

need the assistance of our knowledge and experience? What more can, or ought, we to do than we are now doing?

Our society published this past year 1,200 magazines per month, or 14,400 in the year. If our membership are doing their full duty, as very many are doing, this means that a good many people see our monthly, as our members do not retain them, being furnished later with a cloth bound volume containing the same matter in a permanent form. To supply the bound volumes needed for this purpose consumes a large portion of the 1,800 that the present state law provides for us, 300 of which are bound in paper. We reach a good many people besides those referred to above through the agency of the public libraries of the state, where our volumes are to be found. But we are not satisfied. There must be other channels through which we can reach the people. Shall we send our monthly gratuitously to the public reading rooms and libraries of the state and our bound volumes to the school libraries? Or would it be well to endeavor to introduce the study of horticulture into the public schools by the use of some simple primer, to which a short time might be given, say once a week? Perhaps it might be well, too, for the society to deal a little more liberally with the local organizations if some plan could be devised to bring the horticulturists of each neighborhood into a local band, all of these local organizations to become a part of the central society, which would give it strength and increase the avenues through which the people might be reached.

The financial statement of the year is as follows:

RECEIPTS.

Advertisements in magazine	$154 38
Books sold	3.75
Express repaid	.40
Mileage M. & St. L. R'y sold	13.50
Agricultural Society	8.00
Life fees	52.00
Annual fees, 1895	25.00
Annual fees, 1897	27.50
Annual fees, 1898	614.00
Annual fees, 1899	69.00
Annual fees, 1900	1.00
Hennepin County Savings Bank	100.00
Total	$1,068.53

EXPENDITURES.

Stationery and printing	$149.79
Postage	84.81
Postage on magazine	27 50
Directing and mailing magazine	18.25
Express	66.05
Reporting	103.00
Engravings for magazine	47.37
Expenses annual meeting	86.69
Expenses delegates, etc	108.56
Assistant librarian for 1897	11.50
Books, etc., for premiums	39.07
Insurance	5.60
Office rent	144.00
Office fixtures	43.91
Office assistance, etc	28.40
P. M. Gideon, aid in exp. work	100.00
Sundries	4.03
Total	$1,068.53
Deposited in Hennepin County Savings Bank	$730.51

to which amount some interest is to be added.

MEMBERSHIP:

The number of annual members on the roll for the year just closing is 760, which is 117 more than for the preceding year at the time of the annual meeting. The life roll has been increased during the year by the addition of six names; and decreased by only one death, that of Andrew Peterson, who passed away March 31 last. Our life members will be interested to hear that the life certificate, which has been talked of for a good while, has at length materalized and will be soon sent out. We hope it will be handsome enough to deserve a neat frame, and that you will be proud to hang this emblem of your membership with us on the walls of your homes. Besides the foregoing, we must record the deaths of J. O. Barrett and J. A. Sampson, both old members, as occurring during the year.

We have felt a special pride in the fine exhibit of fruit at the state fair. To those of our members who were present no reference is needed, but for the benefit of others the simple statement that there were on exhibition altogether 5,300 plates of fruit, will give some idea of the extensiveness of this exhibit. We occupied practically the whole hall. What we may be able to do next year to improve on this remains to be seen, but certainly it will be very difficult for us to increase upon last fall's show of fruit. It was a source of some regret that we did not have an opportunity to make a horticultural exhibit at the Omaha Exposition, but the funds at the command of the state commission were insufficient to allow our interests the amount necessary to make a creditable exhibit, and it was reluctantly abandoned.

Reference should by strict right be made in this report to the very efficient assistance rendered the society in its efforts to reach the people by the lecturers on horticulture in the Farmers' Institutes. The different lecturers of late years, including Mr. Clarence Wedge, the lamented E. J. Cutts, Ex.-Sec'y Oliver Gibbs, Jr., for a short time, and during the most of last winter Mr. A. K. Bush, have made a practice of distributing regularly at the institute copies of our magazine and other society literature, which has been the means of securing a good many members for the society, and of promoting very largely the interests which it is the mission of the society to foster. The statement is no reflection on others who ably filled this position prior to this time, as the society then had no similar literature for distribution. You will be pleased to know that Mr. O. M. Lord is this winter to fill the position of horticultural lecturer at the institute, and is today on the platform at Morristown making his maiden speech and giving out good horticultural tracts.

ANNUAL REPORT OF THE TREASURER FOR 1898.

C. W. SAMPSON, TREAS.

1898. RECEIPTS.

May	3.	Balance from retiring treasurer	$ 158.66
"	3.	State Treas., semi-annual allowance	750 00
Aug.	13.	" " " "	750.00
"	15.	Secretary A. W. Latham, an. dues, etc.	644.77
			$2303.43

1898. DISBURSEMENTS.

Order No.	55.	Exp. Secretary's office from June 23, '97, to Dec. 6, '97	$ 292.47
"	56.	Premiums, 1897 annual meeting	106.25
"	57.	C. Wedge, Exp. Ex. Board, etc	22.00
"	58.	Secretary's salary, first quarter, 1898	200.00
"	59.	" " second " "	200.00
"	60.	Exp. Secretary's office from Dec. 6, '97, to June 25, '98	655.32
"	61.	Premiums, 1898 summer meeting	68.50
"	62.	J. S. Harris, Exp. Ex. Board	12.80
"	63.	Secretary's salary, third quarter, 1898	200.00
"	64.	" " fourth " "	200.00
"	65.	Treasurer's salary, '98, C. W. Sampson	25.00
Dec.	5.	Balance on hand	320.98
			$2303.43

LIBRARIAN'S REPORT.

A. W. LATHAM, LIBRARIAN.

There have been added to the library the past year sixty-seven volumes by contribution, and something over one hundred have been ordered, to pay for which the board has made an appropriation of $300. The list will be published in full in an early number of the "Horticulturist." For the acco nmodation of these new books, a section of Wernicke's library shelves has been procured, with glazed fronts to protect them. It is hoped that the members will, as convenient, call at the library and see these new acquisitions, which are largely standard horticultural works, and we expect will be made of great value, especially for the purpose of reference. Perhaps some system should be devised whereby those members who cannot come to the office could have the use of these books.

The assistant librarian, Mr. E. A. Cuzner, reports his inability to make a list of what he has on hand until the holidays. It will be practically the same as last year or the year before, with the addition of about 500 volumes of the reports of 1897, half of which are in cloth, the balance in paper.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

(ADOPTED AT THE ANNUAL MEETING.)

The committee to whom you referred the president's address appreciate the suggestions in regard to securing a home for the society, and to carry out the suggestions offer the following resolutions:

Resolved, That a committee of three, consisting of J. M. Underwood, Wyman Elliot and A. W. Latham be, and is hereby, appointed to confer with the proper authorities in regard to obtaining a home for the society.

Resolved, That we, as a society, recognize the work of the Women's Auxiliary, and recommend that the members do all that they can to aid and further their work.

Resolved, That the president appoint a committee of one to confer with the state superintendent of public instruction to devise some plan whereby the study of horticulture and forestry may be introduced into our public schools.

Resolved, That one thousand dollars reward be offered, as recommended by the president, to secure the introduction of a first-class late-keeping variety of apple, that is as good as the Wealthy in size, quality and appearance, that will keep as well as the Malinda, and is as hardy and prolific as the Duchess, all the details in connection with putting this resolution in force to be left with the executive board.

THOMAS T. SMITH,
R. A. WRIGHT,
DEWAIN COOK,
Committee.

Mr. Barnes, (Wis.): Is that offer extended to your society only or to your state alone, or is it extended to your sister states?

The President: It is open to the world.

Mr. Barnes: We will be with you then. (Laughter.)

Mr. Elliot: The idea occurred to me when that report was read that that money should be put into a fund and the interest from that fund should go to make other premiums for other fruit—that would be my idea. I think the idea of referring it to the executive board is a good one; it would receive intelligent attention at their hands, and I do not think the executive board would be a body of men to take the money and use it while waiting the introduction of new varieties. I think the matter would be perfectly safe if left in the hands of the executive board for disposition.

Mr. Harris: It is expected that the executive board will make some kind of a rule governing the introduction of that apple; probably the apple will have to be grown in a dozen

different places in order to test it. It should be in the hands of the executive board whenever the apple is found.

The President: So far as the money is concerned, there will be no trouble in securing that. The recommendation is that this society take this step to show its interest in this matter and put it in some form, so it may be shown that the state horticultural society is back of this movement.

Mr. Bush: This is a matter I have had in mind for some time, and it is an excellent idea, and if we find an apple of that kind it will be worth many times its cost to Minnesota.

Mr. Barnes, (Wis.): I want to suggest this, that if the goal is never reached, which, however, I hope will be, this action of the society will be worth millions of dollars to the northwest. We will go at it with new vigor, even if we never reach the premium, and the effort put forth to obtain that new apple will be of wonderful value to the horticultural interests of the northwest. I want to congratulate you as being the banner society in offering such a reward. I believe our future prosperity and wonderful improvement lies in the originating of new seedling varieties and the propagation of varieties already originated.

Mr. Walker: Does not that need some explanation? As I understand it, it must be an apple that can be grown here in Minnesota.

Mr. Philips, (Wis.): If it is as hardy as the Duchess it can be grown here.

Mr. T. T. Smith: In regard to carrying out this matter, it will require a good many years to test the tree so it can pass the test prescribed. In 1871 I came into this society and asked for a list of trees suitable for planting in this section. The society appointed a committee, of which Dr. Jewell was a member, and that committee made up a list, and of that list there is but one tree that the society recommended that is alive today, and that is the Duchess. There were Ben Davis, Famous, Perry Russet, Saxton, Tetofsky and the Haas. I planted the whole list the next year, and I have but seventeen trees left—two of the Tallman Sweet and the others the Duchess; all the rest went in the hard winter of 1873.

Mr. C. L. Smith: There is one point that suggests itself to me. It is the intention that this reward shall be given for the production of this variety of apple, and is it to remain the property of the originator, or is the society to own the stock for dissemination? You can readily see how that some man

might have the monopoly of that tree and go around selling trees at two dollars apiece. It seems to me very important that before the reward is paid the stock should be placed in the hands of our experiment station for this society in such a way that the man who originated the apple should get the reward, but should not have a monopoly of the tree after the society had paid the reward.

Pres. Underwood: I will personally give a thousand dollars to the man who will originate an apple tree of that kind, and he can have the monopoly of the tree. I tell you I think he ought to be protected. A man who introduces such a new variety ought to be protected so he can make some wealth out of it and live in affluence all the rest of his life. You would not be likely to pay more than the tree is worth. In the east Ellwanger & Berry and many others have introduced some little plant just for ornament, which perhaps sold for three dollars apiece. Many people out here have paid three dollars apiece for some such tree or shrub, but they think if a man pays three dollars for an apple tree he is swindled. A man who gets a real good apple tree and pays five dollars for it is not swindled. It is not a question with me whether the introducer is going to make a fortune out of it or not. We want to get as good a tree as it is possible to get in the northwest. There are lots of people who would be glad to pay for such a tree, because it would be worth that to the country. A man who raises such an apple is not going to take it and bottle it up or tie it up and fix it in such a way that we will not get the benefit of it. He could not put it on the market at an exorbitant figure and have it bought freely. You have got to put some trust in him. So far as I am concerned, I would be willing to give a thousand dollars for the introduction of a new variety, that is, a tree such as we have described, say to P. M. Gideon, and he would be at perfect liberty to control its sale for planting. If he can make anything out of it, he can have it. I think the intent and spirit of that resolution is to give a thousand dollars reward for the propagation of the variety of apple described. If Mr. Barnes or any one else gets the thousand dollars from this society, let them make a fortune out of the tree; I would be glad to see them do it.

Mr. Barnes, (Wis.): It is offered as a reward and not as the purchase price of the tree.

Mr. C. L. Smith: I raised the question in order that we might not have a dispute over it hereafter as to what the

intention was when the resolution passed. If the intention is to give one thousand dollars reward and get nothing else out of it let us understand that, and if we are not going to have the tree for dissemination let us understand that.

Mr. T. T. Smith: It does not say purchase price, the word used is "reward," that "a thousand dollars reward be offered, as recommended by the president."

Mr. Harris: I am an anti-monopolist all over, but I do not believe that any man can create, or regulate, or introduce that apple and comply with all the rules as they will be laid down by the executive board, and then corner the tree and offer it for sale at from three to six dollars apiece. I believe if we could get cions of it this spring I would be willing to give one hundred dollars for a dozen cions of that kind of tree today. I do not think it will ever be monopolized so it will not be sold at a reasonable price, because it has got to be tried at more than one place before we pay the reward.

Prof. Hansen, (S. Dak.): How long a period of trial will be needed?

Pres. Underwood: That will be left for the executive board to determine. When they are satisfied that the tree fulfills the requirements and the spirit of the resolutions, I think they will be ready to pay over the thousand dollars.

Mr. Barnes: Does that proposition apply to varieties already originated, or must they be originated in the future?

Pres. Underwood: If they have had anything of the kind covered up I think this would bring it out.

The report of the committee was then unanimously adopted pursuant to the motion of Mr. Harris.

WINTERING CELERY OUTDOORS.—Last autumn I decided on wintering my celery in my garden, as here in Essex county, Ontario, Canada we have unusually mild winters, so instead of lifting it and putting it in the cellar in the usual way, and by which a year ago, owing to the warm weather up to Christmas, I lost a large amount, I continued adding a little more earth to the rows as the nights became frosty, eventually covering it entirely over; then as the frost increased I put on a layer of coarse litter from the manure heap, which drew out the frost of perhaps one inch which crusted the earth over the rows. From time to time I added more as I thought it was needed. The manure heap being close to the celery bed, a few minutes only was needed at any one time to do the work, and there has not been a time during the winter but with a fork and spade in a few minutes I could take out for immediate use what was required. It has matured grandly, developing that melting crispness and nutty flavor so much desired and sought after, sometimes in vain, in our winter celery, and to-day, February 14, as fresh as in autumn, and I have not lost a single root. The labor has been a mere trifle compared with the old method of digging and cellaring.—*John Morrison.*

Women's Auxiliary.

CONSTITUTION OF THE WOMEN'S AUXILIARY OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

Adopted December 9, 1898.

NAME.—This society shall be known as the Woman's Auxiliary of the Minnesota State Horticultural Society.

OBJECTS.—Its objects shall be to advance public interest in adornment of home, school, and village grounds, in the observance of Arbor Day, in park and cemetery work, and in flower culture for the house; to study the relation of household economics to horticulture, to aid the Horticultural Society in the furtherance of its work, and to affiliate with the Minnesota Federation of Women's Clubs, especially in the department of country and village improvement.

MEMBERS.—Any lady already a member of the Horticultural Society may become a member of this Auxiliary upon application; others upon the payment of twenty-five cents annual fee. The fees shall become due at the annual meeting.

OFFICERS.—The officers shall consist of a president, vice-president, secretary and treasurer, and an executive board of five, of which the president and secretary shall be members, *ex officio:* They shall be elected at the annual business meeting and hold office one year. Their duties shall be such as devolve upon officers of similar societies.

MEETINGS.—There shall be an annual business meeting at the same time and place as the winter meeting of the Horticultural Society, and a meeting at the same time and place of the summer meeting of the same.

AMENDMENTS.—This constitution may be amended at any meeting by a two-thirds vote of the members present.

ANNUAL MEETING, WOMEN'S AUXILIARY, DECEMBER, 1898.

MRS. ANNA B. UNDERWOOD, SEC'Y, LAKE CITY, MINN.

At the business meeting of the Women's Auxiliary, held December 9th, a constitution was adopted and the following officers were elected for the ensuing year: Miss Emma V. White, Minneapolis, president; Mrs. Jennie Stager, Sauk Rapids, vice-president; Mrs. Anna B. Underwood, Lake City, secretary; Mrs. L. R. Moyer, Montevideo, treasurer; executive committee: Lucia E. Danforth, Northfield; Dr. Mary L. Whetstone, Minneapolis; Mrs. O. C. Gregg, Lynd; Miss S. Ella Lyon, Minneapolis; Mrs. A. A. Kennedy, Hutchinson.

Mrs. Underwood gave her report as delegate to the Minnesota Federation of Women's Clubs, and also read the report of the "Town

and Village Improvement Committee," as given by the chairman, Mrs. R. L. Gale, St. Cloud.

An improvement league should be formed in every town, village or country neighborhood. Plans for work should be decided upon, and the best method for carrying them out should be thoroughly discussed. The spring months are so full of the hurry and rush of re-awaking life with its attendant labors that not much can be accomplished in planning, so these quiet winter months should be taken for that purpose. The secretary will be very glad to answer all questions, and render all assistance possible to any one interested in taking up the work.

REPORT OF THE WOMEN'S AUXILIARY.

(Made at the Annual Meeting of the Minnesota State Horticultural Society, 1898.)

MISS E. V. WHITE, PRESIDENT.

Mr. President, Ladies and Gentlemen:—The movement of the Women's Auxiliary is still in the incipient stage, and we have very little to report. We hope to have it in working order in another year and be more in evidence than we are at this time. A year ago, on the recommendation of your president, a resolution was adopted to the effect that the Women's Auxiliary be organized. In pursuance of that resolution the ladies who were in attendance at the summer meeting, at the State Experiment Station, met and effected a temporary organization, which organization is still in force, as we have not yet had our annual business meeting. We have however outlined in our own thoughts what should be the object of this organization. The object is to work along lines somewhat like these: village improvement; decoration of school grounds and home grounds, especially in the country and in villages; the relation of horticulture to domestic economy; possibly park and cemetery work, also to work in affiliation with the State Federation of Women's Clubs. In order to do that, it was necessary to organize as a special body. They have one department devoted to country and village work, and it is to affiliate with them, in that line especially, that we hope to accomplish something. We also hope that we may be an aid to the horticultural society in any way that we can be of assistance to you.

I think, Mr. President, this is all I have to report at this time.

Mr. Hartwell, (Ill.): I am a foreigner at this meeting, and it has been a matter of wonder to me what the object of this auxiliary may be. What does the auxiliary do?

The President: In the state of Minnesota there is a large amount of work being done by women. They have a federation of women's clubs, and they are organized in such a way that the men are not allowed there, and in order to bring the work of our horticultural society in touch with that organiza-

tion—and it is a very strong and prosperous organization, and will be an influential organization in this state—in order to come in touch with that work it was thought best to organize a woman's auxiliary horticultural society, auxiliary to the state horticultural society. The women are entitled to become members of this society, they are perfectly welcome to take part, and do take part in a measure in the deliberations of this society, but this organization was thought best in order to come in touch with the women's clubs of the state; and I think from the very auspicious commencement they had at our summer meeting it will be the means of bringing out a great many women who will work together along horticultural lines in which we do not do much, especially in the ornamental part of it, which will be of great value to the society and state. Perhaps this explanation will be sufficient.

Mr. Hartwell: That is all right. I say amen to it.

CIRCULAR LETTER, 1898, TO WOMEN'S CLUB OF MINNESOTA.

ISSUED BY STATE FEDERATION OF WOMEN'S CLUBS.

(This circular is introduced to show the lines along which the Woman's Auxiliary expects to work in common with the state organization of women.—SEC'Y.)

We appeal with confidence to the members of the clubs throughout the state to secure their hearty and active co-operation in the important work of improving and beautifying its villages, towns and cities. What is needed is intelligent leadership and united efforts along the following lines:

1. To make the grounds at and about all school buildings as attractive as possible, giving especial attention to the school buildings in the country districts.
2. To have the rubbish cleaned from vacant lots as well as from along streets, alleys and roadways.
3. To have all parks and other public grounds, whether about buildings or otherwise, beautified, especially church grounds.
4. To secure well kept lawns, and encourage the planting of trees along the streets and highways, The free distribution of flower and garden seeds among those unable or indisposed to purchase them is recommended.
5. Much can be done in almost every town in the way of improving cemetery grounds.
6. Study the conditions of your towns and vicinity in order to discover if there are any special directions in which work to secure these desired ends can be made.
7. Interest the local press and secure its aid in directing the attention of the people to the desirability of making their grounds and their town more attractive.

8. If funds are needed they may be obtained by means of entertainments, by subscriptions or by club dues. When public sentiment is properly educated individual effort can be largely relied upon to secure these improvements.

9. Placards for use in schools embodying the matter given on the last page of this circular letter have been printed and will be sent to any address upon application to the chairman of the committee. They should be posted in school buildings, the consent of the superintendent or other officers in charge being, of course, first secured.

10. We call attention to the forestry resolutions passed at the October meeting of the federation to be found on the fourth page of this letter. The committee would suggest that once each year the different clubs devote one meeting to the discussion of the question, "What can we do to beautify our town?"

MISS MARGARET J. EVANS,
State President Federated Clubs.

Town and Village Improvement Committee.—Mrs. Robert L. Gale, Chairman, St. Cloud, Minn.; Mrs. O. N. Ohlberg, Albert Lea, Minn.; Mrs. Louise F. Stone, Morris, Minn.; Mrs. L. P. Blair, 4228 Park Boulevard, Minneapolis, Minn.

DO.—Make your yard and street in front as clean and pretty as you can.

Plant or help plant shade trees.

Cultivate as many flowers as possible.

Burn or bury all tin cans and other rubbish.

Pick up and destroy all loose paper, small branches, and similar things.

Dig up and burn unsightly and harmful weeds.

Pile wood neatly, dispose of all ash heaps, and keep a tidy back yard.

DON'T.—Don't throw upon the sidewalk or into the street, banana or orange skins, watermelon rinds, nut shells or anything else.

Don't scatter pieces of paper on the street.

Don't mark sidewalks or buildings.

Don't injure young shade trees by bending, cutting or shaking.

Don't spit on sidewalks or floors.

FORESTRY.

WHEREAS, The meeting of the General Federation of Women's Clubs, at Louisville, May 29, 1896, adopted the following resolution:

"*Resolved*, That as General Federation of Women's Clubs and as individuals, as far as possible we pledge ourselves to take up the study of forest conditions and resources, and to further the highest interests of our several states in these respects;" and

WHEREAS, The natural wealth of the state of Minnesota consists largely of forests, the protection and improved management of which, as well as the reforesting of denuded waste lands, is a question of growing interest and importance, therefore,

Resolved, That the study and discussion of economic forestry in this state should be taken up and generally encouraged, and that a committee, with power to act, be appointed to carry this resolution into effect.

TOWN, VILLAGE AND COUNTRY IMPROVEMENT.

MRS. ANNA B. UNDERWOOD, SEC'Y, 1899, LAKE CITY.

There is a movement abroad in the land, with which it behooves us to fall into line, not only because of its own worth but because the Minnesota State Horticultural Society is naturally qualified to be of great service to it by virtue of its long experience. This improvement, if I am not mistaken, was inugurated in Minnesota by the State Federation of Women's Clubs. The federation has accomplished great results through its systematic efforts, especially with those questions in which women are most interested. Annually they are drawn together to talk over the work of the past year and to form plans for the future. So far their attention has been mainly directed toward the educational features of reform, not alone considering courses of study to be pursued in the school-room but weighing carefully the results of school-life as pertaining to and influencing the future manhood and womanhood of the children. All realize that something is lacking in the discipline that is brought to bear upon child-life. Perhaps it is the fault of birth, of acquired surroundings or imperfect instruction in the school-room. Whatever it is, it must be brought to light, and a remedy found and applied. Men and women in all conditions in life are striving to solve the problem of unrest that seems to bid defiance to all law and order. Many are the plans advanced and tried for regulating the various evils, and when one part of our world seems to be well regulated and in good running order, lo! our hearts are torn over the miseries exhibited in another part.

The club women of Minnesota are banded together to guard and preserve the essential requisites for true home-making. Their homes may be all that heart could desire, but they know that there are many in which inharmony with its attendant miseries reign supreme. They have assumed the task of tracing to its source the cause of unhappy conditions of home, town, village and country life, to be followed up by strenuous efforts to establish a new order of things. Here is a feature of their educational work: to gain an entrance into these homes, and by instruction, accompanied by coercion if necessary, bring the occupants into the folds of right thinking and right living. "Am I my brother's keeper?" Yes, in so far as being responsible for his unfortunate condition is concerned, and responsibility does not cease until every home is brought up to the highest standard possible.

Discontent in the smaller towns, villages and country, gives rise to a general exodus to the larger cities, without conditions being changed for the better. We have heard this aphorism for years, "Make the home pleasant and attractive, and the children will love it and be loth to leave it." Let us change the words and have it read this way: "Make the town, village and country beautiful, and the inhabitants will love them and be loth to leave them." It is as true as the other.

Acknowledging this fact, the constitution of the State Federation of Women's Clubs provides for a standing committee, known as the Town and Village Improvement Committee, the object of which is

to study into the needs of towns and villages, to arouse and encourage general interest in the work of improvement, and to suggest simple, practical methods for beginning the work.

The cities are planning constantly to make their surroundings more beautiful, thereby involving the expenditure of vast sums of money. They are awaking to the fact that generous park systems are essential to give them prestige with the great traveling public, to say nothing of administering to the pleasure and comfort of the residents. These days record a kindly rivalry between them to see which shall have the greatest number of acres of parks per capita. We in the outlying country may admire the energy that brings this about, but at the same time we should be encouraged to emulate it as far as possible. The smaller towns and villages need to be aroused to action, to realize the needs and possibilities of their own surroundings. First of all, they should rid themselves of unsightly objects, unwholesome places; weeds should be kept down on vacant lots and unused streets; all tumble-down fences should be straightened up or taken away; dilapidated buildings removed. It is a mistaken idea that we are responsible for our own yards only. If we through education and other advantages are fitted to keep home grounds in perfect order, it is only part of our duty to do so. The balance of our duty requires us to help others to reach the same standard. Of course, a slovenly kept yard cannot be entered and put to order, but the streets, which are the common property of all the grounds around all public buildings, the buildings themselves, can be operated upon by arousing public sentiment, and very soon the owners of all unkempt, unpleasant looking places will fall into line and keep step in the march of improvement, if only through self-interest in the value of property.

All appreciate the value of little things as influencing the general welfare, for good or ill. "Tall oaks from little acorns grow." The tall oak if scraggly, gnarled and twisted out of shape is a difficult subject to model; but the tiny acorn, from the time it puts forth its first leaves above the ground is susceptible to any influence that may be brought to bear upon it. This is the idea to work upon as applied to the higher order of life in man. If a child is taught to be cleanly and orderly, thoughtful and considerate of the comfort of others, the habit formed will follow him through life and will manifest itself throughout the larger avenues of experience.

This thought evidently influenced the Town and Village Improvement Committee to put forth the card of "Do's and Don'ts." A child taught to observe its requirements will form habits that will later lead him to take a personal interest in all matters pertaining to his own home, that it shall be orderly and pretty; to his own street, that it shall be as fine if not the finest of any; in fact, he will use every effort that his own village, his own town or his own part of the county, throughout its length and breadth, shall be as beautiful and attractive as it is possible to make it.

If one child alone is educated to adhere to these suggestions, it is well. One home will be made happy. But if all the children of a community, generation after generation, are similarly brought up, what a paradise on earth we would have! Is it not well worth work-

ing for? Thinking women will appreciate the value of such a beginning; it is simply an opening wedge to more that is to follow.

The Woman's Auxiliary, offering this as an instance of one feature of the work to start with, wishes to urge the formation of improvement leagues in every town, village and farming community in the state. Let us note the present condition of such. It seems to be one of general indifference to surroundings. Each man's yard or farm is his castle—figuratively speaking—and he does as he is inclined with it. He can place his house even with the street, thus shutting off the view of an artistic neighbor who wants a well kept lawn in front of his home.

The owner of the next lot will have a space in front, perhaps, but will have it so full of trees and shrubs that hardly a glimpse of heaven's blue can be seen. As for the ground in the rear of the buildings: well, in one-half of the yards, it is the receptacle for rubbish of all grades and descriptions, from chips to a conglomeration of boxes, barrels, tin cans, washboilers, old stoves, etc., making a pile so high that it looks over with an exultant air into the dainty orderliness of the neighboring yard, as if to say,—"You can't get rid of me."

The beautifying of individual homes is laudable and has its influence, encouraging others to like effort; but there are many, who, because they cannot do just as their more wealthy neighbors have done, feel that there is no use in making an effort to better their surroundings, erroneously thinking that it is the spacious, elegant house that is the essential and attractive feature of the home.

Have you ever stopped to think how monotonous and unattractive a city would be if all the houses were equal in size, beauty, etc.? How intense and frequent would be the poetic sighs for "a vine-embowered log cabin," "a lodge in some vast wilderness," and so on! It is variety that is attractive and satisfying. A tiny home, perfect in all its appointments, snuggling cozily under beautiful vines, a well kept lawn, all parts of the grounds trim and neat, is a sweet picture to lay away in the memory.

Every town and village should have a park commission, to whom would be entrusted the care and management of all the public grounds, streets, alleys, roadways, etc. The members should be selected for their interest in the work and fitness for the position. They should have an ideal plat of land under their charge, and should then educate the residents to an appreciation of the necessity of working to such a plan. Such a commission should be qualfied to answer such inquiries as: what to plant? how to plant? where to plant? Without doubt the greater part of the land-owners would be only too glad to avail themselves of such a service, having neither time nor ability to study out for themselves the best plan of beautifying their lots. Least of all would they stop to consider whether their plan would harmonize with the other lots in the block.

Such a commission, having full control of the streets, would have a harmonious whole. A street named Oak street would not be lined with soft maple, or Elm street lined with white ash. Not a tree would be planted without due consideration as to its merits for the place.

Such a commission would see that the trees were properly pruned, and having secured a fine row of trees would not allow them to come to harm through neglect or abuse.

Such a commission would use every effort to eradicate the old idea that teams need eighty feet of roadway and that nothing should limit them but the fence lines, and it would teach the people that twenty-five or thirty feet, at the most, is all that is necessary.

To quote from a most excellent paper written by Chas. M. Loring, and published in the *Park and Cemetery*,—"As a rule, the roadways on our residence streets are too wide, and there is not space enough given for trees and other ornamentation.

Fine effects are produced on an eighty foot street by making the roadway thirty feet wide, leaving twenty-five feet inside the curbing on each side, six feet of which, next to the lot line, is for a walk, and nineteen feet for grass and flower beds, or groups of ornamental shrubs, and shade trees planted from forty to fifty feet apart!"

Again from the same paper,—"Another plan which I have seen in an eastern city gives a park-like appearance which is very pleasing. That gives a sidewalk next to the lot line six feet in width, a planting space for grass and trees of six feet, two roadways eighteen feet wide and a center planting space of twenty feet, filled with grass and shrubs or grass and beds of flowers."

Does not this simple, practical plan appeal to you? Cannot the mental vision picture the outcome of such an order of things. Can not you see the peaceful content that comes from having the heart-craving for beauty satisfied, the enlarged field for work and usefulness, homes made so home-like and restful that the inmates are loth to change and, finally, a community made a *fraternity* through its united interest in what concerns the general welfare?

Members of the horticultural society, you now have an inkling of what the Woman's Auxiliary is after. You have done a grand work in the past, you have a glorious future to look forward to. You have shown your strength and power in accomplishing your purpose of advancing fruit culture; you have thrown your influence for good freely throughout the state; you have ever been loyal to woman's work and interests, and to you we look for encouragement and assistance. We want every mother, wife, sister, daughter, relative and friend among you to become active members of our organization.

Will you see that they are fully informed, and urge them to make application?

WHAT IS A NO. 1 APPLE?—According to resolutions adopted by the national apple shippers' association, grade No. 1 shall be divided into two classes, A and B. The standard for Class A shall be not less than 2½ inches in diameter, and shall include such varieties as Ben Davis, Baldwin, Greening and others similar in size. The standard for class B shall be not less than 2¼ inches in diameter, and include such varieties as Romanite, Russet, Winesap, Jonathan, Missouri Pippin, etc. No. 1 apples shall be at time of picking practically free from the action of worms, or defacement of surface, or breaking of skin; shall be hand-picked from the tree and of bright and normal color and shapely form.

NORTHEASTERN IOWA HORTICULTURAL SOCIETY ANNUAL MEETING, 1898.

J. C. HAWKINS, AUSTIN, DELEGATE.

Your delegate to the Northeastern Iowa Society meeting, owing to delays at Cresco and Calmer, Iowa, did not arrive at McGregor until late Tuesday evening, Nov. 19th. He found all the leading horticulturists of northeast Iowa assembled at society headquarters at the Ryan House—and quite indignant over a misunderstanding as to the society's occupying the new opera house Tuesday afternoon and evening.

The society had held an informal meeting that afternoon in the hotel parlor, and received the reports from the district directors. The reports were very flattering, and especially in the northeast district the fruit was of good quality—above the average.

In the fourth district, W. H. Guilford reports great strides along all lines of fruit, especially cherries, pears, peaches and plums. Peaches were quite plenty. He had fifty bushels sold at $1.00 per bushel in Dubuque. Hawkeye is a very large, fine plum. He put them on the market in the same kind of package and at the same price as the California plums. The dealer was afraid they would not sell, yet they did, and in a few days he was making inquiries for more of them, and could sell them at a higher price than the California plum. Mr. Guilford named the following list as the very best for his district: Forest Garden, Wolf, Hawkeye, Rollingstone and Wyant.

Mr. G. A. Ivens, of Iowa Falls, recommends the Stoddard as a very fine plum and one of the best for market; also the Old Comfort. Mr. Ivens has a German prune that he thinks very favorably of; it is a free stone. One of the German settlers brought the seed from Europe some years ago, and it is doing so well that quite a sprinkling of the trees are being scattered over the county. The sprouts or shoots from the roots bear the same as the parent, and are eagerly sought after by the neighbors. Some farmers had bushels of them lying in the warm autumn sun to dry for winter use. Mr. Ivens thinks he has a cure for black-knot. He cuts them out with a chisel or gouge and paints the wound with red lead.

"What to Plant in a Plum Orchard"—Dr. A. B. Dennis, Cedar Rapids. He has 2,000 plum trees fruiting. The pure Americana are superior to all others. He has over 300 in cultivation of the native varieties, and would not recommend any other for planting.

We soon learned that the leading questions for the consideration of this society were marketing fruit and cold storage. The first was a very difficult question, and the conclusions unsatisfactory.

Mr. George J. Kellogg, of Janesville, Wis., was there to get all the information he could on cold storage. If we could carry such varieties as the Wealthy, Haas, Utter and Plumb Cider, that would in great part solve the market question. Duchess was a failure with him in cold storage, as it would break down and rot inside of a

week after being taken out, while Wealthy would hold up a month or more. Mr. Kellogg showed two plates of Wolf River, one having been in cold storage two months and the other having been kept in a common cellar. They were submitted to the fruit committee, who reported the following:

Your committee, after examining these plates of fruit, believe from the relative condition in which they found them that they can detect no loss or deterioration in quality or flavor in the cold storage plate, and we believe that apples can be so profitably carried.

Mr. J. C. Ferris, of Hampton, said with him there was not much difference in the keeping of Wealthy and Plumb Cider.

Mr. Kellogg stated in regard to the Northwestern Greening, it is taking the first place in the Northwest and has neither blighted or sun-scalded in the orchard. It is a seedling, and its origin is not known. It is not as good a bearer as the Wealthy, yet is a good bearer, and he considered it hardier than the Wealthy. He also says the Winsor is a wonderful apple and a keeper. He knew of Tallman Sweet grafted on the native wild crab in the forties that are good and productive trees yet. The Pewaukee is a better fruit and a better tree every way than Ben Davis.

Top-working was talked in earnest and has a firm hold in that section of country.

Mr. C. G. Potter recommends Fameuse on Hibernal. He also exhibited his seedling, Brilliant, and accompanied it with the following history:

A pure Fameuse seedling; stands in an unfavorable, hot location; no blight, apparently 10 to 15 per cent hardier than its parent; vigorous grower; good form; fruit about one-third larger than Fameuse and believed to be as good or better keeper; a good bearer and a very beautiful apple. It did not bear young; largely I believe because it was too long crowded and uncultivated.

"The San Jose Scale"—Prof. H. E. Summers. This was one of the most valuable papers presented, and the most important action of the society was the discussion the San Jose scale. It was plainly shown that it threatens great danger to our fruit and ornamental trees and shrubs. Specimens of bark infested with this pest were in evidence in a bottle and were examined with much interest.

It is difficult to mention the most important papers, for they were all excellent and to the point; were up to date, practical and short.

Wednesday evening—Address of welcome by Mayor J. A. Walker; response by C. G. Potter; literary and musical entertainment by the McGregor high school and closed with a lecture on the Hawaiian islands by Hon. George H. VanHouten, of Lenox, Iowa. The entertainment was of a high order, a rich feast of good things.

Cresco, Iowa, was selected as the place for the next meeting, and C. F. Gardner, of Osage, was elected president; Elmer Reeves, vice-president; C. H. True, of Edgewood, secretary, and G. A. Ivins, of Iowa Falls, treasurer.

Altogether it was a very pleasant and instructive meeting.

NORTHERN ILLINOIS HORTICULTURAL SOCIETY, ANNUAL MEETING, 1898.

R. S. MACKINTOSH, DELEGATE.

I left the land of icebergs for a place which I supposed to be much milder, but was much surprised to find every one trying to keep warm. The thermometer was hovering near to zero and with a rather sharp wind, which is very cold for that locality.

On account of a wreck I did not reach Galva until 1 p. m. After a hurried dinner I went to the hall to attend the opening session. There were about thirty present, most of whom were from outside towns.

The program began with the report of the treasurer, Mr. Woodard. Mr. Woodard has been the treasurer ever since the organization of the society, thirty-two years ago.

The secretary did not make a formal report, but simply gave a short description of the general features of the work and crops of the past year. He reported that the early vegetables were very fine and brought a good price; strawberries were the best that he ever knew of, but as a result the price was low; peaches, pears and grapes were better than the average; apples were a failure, due, no doubt, he thought, to lack of care and cultivation.

President Hartwell was very enthusiastic about his visit to the Minnesota society. He could hardly hold himself within bounds when speaking of our exhibit of apples. He pointed to the table and remarked that those apples were all from Minnesota and were all of different kinds. He said that it was not remarkable for a man to show one hundred varieties of his own origination. He said also that it was the most earnest body of men that he had ever met.

After Mr. Hartwell had finished talking about Minnesota he read his annual report. His chief desire was that the study of horticulture shall be part of every child's study in the common school. He also wanted to see more fruit and nuts at every farm-house.

The rest of the meeting was filled with papers and discussions bearing on such topics as mulching, cultivation, windbreaks, varieties of apples, pears, peaches, etc., for home use and for market.

The subject of spraying evoked much discussion. It was started by a well-written paper by Mr. A. W. Bryant, the only young man taking part in the program. The general opinion was that spraying was necessary for the best results. The methods in many cases needed to be improved.

Your delegate was called upon to tell of the work of the School of Agriculture in Minnesota. They feel that they need more advantages for the education of the boys and girls from the farms.

The society during the past year has suffered the loss of three of its oldest members. They were Samuel Edwards, O. B. Galusha and A. R. Whitney, the originator of the Whitney No. 20 apple.

The papers on orcharding by H. A. Aldrich and James T. Johnson were listened to with much interest, for they contained many useful helps for one interested in orchard management on a large scale

The entire meeting was one that was profitable to all that attended.

A GIANT ELM.

N. A. M. ROE.

In an unfrequented part of Massachusetts is a tree more remarkable than many of the historic trees. In a place only to be reached by a cross-road stands a giant elm, the spread of whose branches I am sure is not equalled by any tree of the same species in the state. It does not stand straight and tall, with plumey top, as New England elms are wont to do, but reaches out its arms on every side, as if to take the whole region round about into its protecting care. It stands in that part of Framingham called Salem End. We came suddenly upon the tree, driving under one of its branches which stretches over the road and some distance beyond into the orchard on the opposite side. The extreme length of the limb from one side of the tree to the other is 138 feet, north and south. It stands in the yard of an old-fashioned white house, a long two-story building, completely in the shadow of the monster tree. Needless to say the inmates are proud of their tree and perfectly willing to answer any and all questions concerning it. A few years ago they built a rustic stairway up the trunk and out along one of the big straight branches. Twenty-two feet from the center of the tree and twenty-one feet six inches from the ground, is a spacious platform with a rustic rail around it.

Wonder grows as we walk about the enormous trunk. The circumference over the swell of the roots is thirty-six feet, while four feet higher, where the tree divides, it is twenty-two feet. Here one trunk is fifteen feet two inches and the other twelve feet nine inches in circumference. The branches on one side of the tree touch the ground and then start up again, thus making a convenient curve for a seat, a veritable rocking chair. On the side next the house and barns I suppose trimming has kept them from growing so low. There are trees in the state much higher than this, for, as nearly as can be estimated, it is but eighty-five feet.

As seen from a distance it looks like an immense oak, but closer inspection of its leaves and bark shows it an elm. It was planted in 1775. It is still green and vigorous, bears no sign of decay as yet, and year after year the orioles hang their nests from its drooping branches, and robins sing the glory of their magnificent dwelling place. It has seen generations come and go, and if the courses of nature do not change will see several more come and go.—*Orange Judd Farmer.*

THE SAND CHERRY A POOR STOCK.—"Some six or seven years ago we grafted plum on sand-cherry. The scions used were Wyant, Rockford, Wolf and Desoto. Some of these trees fruited in 1897 and all of them fruited in 1898. The fruit we found to be of inferior size and quality, in fact about worthless. We advise caution in using sand-cherry as a stock for plum."

CHARLES F. GARDNER, Osage, Ia.

What is the experience of others?—SEC'Y.

PROF. J. L. BUDD WILL REVISE DOWNING.

AMES, IA., Dec. 31.—Prof. J. L. Budd today resigns his position as head of the department of horticulture and forestry in the Iowa State Horticultural College, which position he has held for nearly a quarter of a century. Prof. Budd came to this college in 1876, and by his work has become well known all over the United States and Canada. In 1882 he toured through Europe and Asia in the interests of horticulture, and the result was the introduction of foreign fruits, which he successfully grafted with home fruits, producing a large number of new varieties which have proved to be the most hardy and stable in the United States. Standard fruit books accredit almost one-half of the existing varieties to the work done by Professor Budd.

Although with today Professor Budd severs his immediate connection with the college here, he will not cease his valuable horticultural researches. At a recent meeting of the board of trustees of the college he was made "Professor Emeritus of Horticulture and Forestry," a degree very seldom granted; in fact, there are few men in the country bearing this degree of high honor.

Professor Charles Downing, of New York, one of the most famous horticulturists of this country, and author of several standard fruit books, at his death, which occurred about eight years ago, willed to Professor Budd his large library, including that of his late brother, Professor A. J. Downing, the great author on landscape gardening, which together made one of the best and most complete horticultural libraries in the world. The very complete posthumous notes on fruit were also furnished Professor Budd, and with these and the information gained from his own researches, Professor Budd will immediately commence the revision of Professor Charles Downing's famous "Apple Book."

Professor Budd's successor as professor of horticulture and forestry in the Iowa State Agricultural College, is one of his former students, Professor Charles Craig. Professor Craig is a graduate from this college and has taken the degree of M. S. in Cornell University, at Ithaca, N. Y. Since Professor Craig left the college here he has held with credit the very responsible position of superintendent of all the provincial horticultural experiment stations of the Dominion of Canada, and has been a member of the sub-faculty at Cornell University.—*Minneapolis Journal.*

WHAT IS THE BAXTER APPLE?—We learn that agents in Southern Minnesota are taking orders for the Baxter apple. It may be all right for this latitude, but who can give us the information needed about it? Our readers are cautioned against buying seedling apples not recommended by the horticultural society. Sec'y.

Biography.

HON. W. W. PENDERGAST.

HUTCHINSON, MINN.

(See frontispiece.)

William Wirt Pendergast, who was elected president of this society at the last annual meeting, was born at Durham, N. H., Jan. 31, 1833, in a garrison-house built as a protection against Indians by his grandfather's grandfather, in 1713. He was brought up to hard work on his father's farm; was sent to the district school until he was fourteen; and was fitted for college at Phillips' Exeter Academy, Durham Academy and the Springfield, Mass., high school.

He entered Bowdoin College in 1850, and now holds the degree of A. M. from that institution. Times were hard and money scarce with farmers while he was in college, so that he was obliged to pay his own way. He taught school winters, studying far into the night to keep up with his class. After leaving college he taught in the graded schools of Amesbury and Essex, Mass., gaining the reputation of being a successful teacher.

In 1856, Mr. Pendergast came to Minnesota and took up a homestead at Hutchinson, where, the following year, he built the first schoolhouse and taught the first school. With eight other young men, he was at Fort Snelling to enlist when the news of the Sioux outbreak was received. All went back to fight the Indians. Mr. Pendergast was placed in command of a squad of the "Home Guards" and took charge of the construction of a fort which was just completed when an attack was made. About 300 Indians surrounded the village, half of which, including Mr. Pendergast's house and academy, they burned. Toward evening, the Indians were driven back, the heroism of eighty "Home Guards" proving too much for the savages.

For twenty years Mr. Pendergast was in charge of the Hutchinson schools, eight years of which time he was also superintendent of schools for McLeod county. In 1881, he was chosen Assistant Superintendent of Public Instruction, a position which he held for seven years, when he became principal of the State School of Agriculture. His labors in this institution the first five years of its existence were crowned with the highest success.

In 1895, he resigned this pleasing and important work to assume the duties of the office of State Superintendent of Public Schools, which position he has so filled as to make himself one of the best known and most highly respected public men in the state. With the first day of January, 1898, by voluntary act, he gives up this position to retire to his rural home in Hutchinson to pass his ripest years in pursuits most congenial to him.

In Mr. Pendergast, the horticultural society has a most worthy successor to Ex-President Underwood, whose long term in this position has so endeared him to us, and we are fortunate in enlisting his services in this new field at this juncture. Under his administration, we may look forward to still larger success in our work.

At the age of 65, Mr. Pendergast is still apparently in the full vigor of life and will, we hope and believe, have still many years of service with us in the cause he loves.

In Memoriam.

NATHANIEL SHEPHERD.

MINNEAPOLIS, MINN.

Died December 3, 1898, aged 75 years.

Nathaniel Shepherd was born at Thedford, Vt., September 23, 1823. He never knew a mother's care, she dying when he was a mere child. He went out to work when twelve years old, working seven years in the first place, after which he learned the painter's trade, which he followed many years. In 1856 he came to Wisconsin, locating in Berlin. One year after he located in Ripon, Wis., where he made his home for over twenty years, and brought up a family of four children, who with his wife survive him.

During the civil war he followed building, doing more for his city in that line than probably any other ever did.

NATHANIEL SHEPHERD.

In 1877 he moved to Minneapolis, thinking it a better place for his children to start in life, and made that city his home most of the time till his death, which occurred while visiting at his daughter's (Rev. Mrs. Spicer), at Warren, Minn., Dec. 3, 1898. He has been a consistent church member for over one-half century, always doing his official duty in the church, and helping far beyond his strength and means. No man can say he ever wronged him in any way.

He was a great lover of the beautiful in nature, and an enthusiastic horticulturist. For many years he was proprietor of the North Star Gardens, and in the early days of the horticultural society was an ever present and active menber. He, with Mr. Woodruff, of Ripon, Wis., was the introducer of the Ancient Briton blackberry, and also the originator of the method of growing by covering, it being at his suggestion that they tried it and found it effectual in securing large crops without loss of vitality from hard winters. Whether building, in horticulture or at his trade, he *always* studied to find the *best* way, and that being decided, carried it out *strictly* in those lines, even though he might not receive as much pecuniary benefit.

His has been a busy life, never taking time for the rest he so fairly earned, but ever working on for the good of his family and church. For the last few years his health had been gradually failing until the end. He was ready to go, only regretting leaving those dear to him for the few years intervening, and then he hoped and believed he should meet them all in immortality. His body was laid away in its final home in Lakewood Cemetery, on December 6, 1898.

Secretary's Corner.

HAVE YOU PAID YOUR ANNUAL FEE FOR 1899?—Perhaps you are one of the few who have not. Sit down and do it now, or notify the secretary that you do not wish to continue with us longer. We need your help and want you to stay with us.

DON'T BUY BUDDED APPLE TREES.—This budded apple tree scheme is still being worked with the uninformed. A root-grafted tree with short scion and long root is far better for this climate. Beware of any who talk "budded apples."

THE IOWA SOCIETY AND HORTICULTURE IN THE PUBLIC SCHOOLS.—Mr. F. M. Powell, of Glenwood, Iowa, presented a strong resolution at the late meeting of that society for the introduction of a horticultural primer into the schools, and a committee was appointed to prepare the primer and get the law to introduce it. We shall watch this move with interest. Iowa's public schools take very high rank.

PRECARIOUS CONDITION OF COL. J. H. STEVENS.—As we write, this old and tried friend of horticulture and the horticultural society is making a gallant fight with a severe attack of pneumonia, and the result still hangs in doubt. Our hearts go out to him in this hour of his distress and trial. No member of our association has more endeared himself to our society or its individual members than he. We hope for the best.

ANNUAL MEETING IOWA HORTICULTURAL SOCIETY.—Friend Dartt (E. H. S.), of Owatonna, is always a busy man, but he consented to help us out as an "emergency" delegate to the Iowa meeting, which met at Des Moines Dec. 13-16. That society sent its president and two other members to our gathering, so Mr. Dartt had to work hard to bring the balance down duly. His report will be found in the next issue, and we may expect a good one.

EX-PRES. UNDERWOOD AND THE WISCONSIN SOCIETY.—At the last session of the executive board Mr. Underwood was selected to represent our society at the winter gathering of this sister organization. Mrs. U. goes along, and reads a paper, perhaps on Women's Auxiliary. It wouldn't hurt our neighbors to do the gracious act to the ladies, as we are trying to do.

THE RUSSIAN NOMENCLATURE COMMISSION REPORT.—This report is now in press and will be sent in pamphlet form for distribution to members of adjoining state societies. The members of this society will receive it in some early issue of our magazine, probably the February number. It will be found worthy of careful study and preservation for reference. It is not understood to represent a complete work but marks a long step in right way.

ANNUAL MEETING SOUTH DAKOTA HORTICULTURAL SOCIETY.—For the first time in years this society held an annual session, convening December 13, 14 and 15 last, at Yankton. Through an unfortunate hitch, our society was not represented, which is especially

regretted, as Prof. N. E. Hanson, the present secretary of that association, has been such a regular and helpful attendant at our annual gatherings. They will ask this year for an appropriation to print their report and otherwise aid their work.

THE $1,000 APPLE SEEDLING PREMIUM.—The executive board has appointed J. M. Underwood, W. W. Pendergast, S B. Green and A. W. Latham a sub-committee to prepare regulations pertaining to the premium offer of $1,000 00 authorized by the society for a winter seedling apple such as Minnesota needs. These regulations will be issued duly. In the mean time sow and plant your apple seeds of all hardy varieties at hand. Every apple grower should also be an originator of new varieties. What more laudable field in which to work, in Minnesota particularly?

NORTHERN ILLINOIS HORTICULTURAL SOCIETY.—This association met in regular session at Galva, Ill., Dec. 13-14. Mr. R. S. Mackintosh was our representative there, and his report will appear elsewhere in this issue. Mr. J. L. Hartwell, the president of that society, will be remembered by those in attendance at our last annual gathering as delegate from the Illinois state society. We enjoyed his presence with us much, and he showed his attitude towards us by having his name inscribed on our life roll before leaving us. May he live long to enjoy it with us!

SOUTHERN MINNESOTA HORT. SOCIETY; SIXTH ANNUAL MEETING.—The program for the regular winter session of this society is on the secretary's desk, and it provides for four sessions, covering Wednesday and Thursday, Jan. 18 and 19. It will meet at Spring Valley. Competition for prizes is open to northern Iowa as well as our own state. Several special premiums are offered by southern Minnesota nurseries. Send to Sec. R. Parkhill, Chatfield, for a program, and if you are in that section of the state don't fail to go and take advantage of the free entertainment offered.

PETER M. GIDEON AT THE ANNUAL MEETING.—A familiar face at our annual gathering was that of this old veteran of Minnesota horticulture, though it is some years since he last met with us. His locks have whitened and his form is not so sturdy as of old, but his interest in Minnesota horticulture remains the same, and he still continues the same enthusiastic experimenter, full of hope and assurance. That he may fully realize his ideals as an originator of new fruits is the hope of all his friends and of none more than the horticultural society, who fully appreciate the value of his efforts.

RESIGNATION OF PROF. J. L. BUDD, HORTICULTURIST OF IOWA AGRICULTURAL COLLEGE.—After nearly twenty-five years' occupation of this position, according to a late press notice, Prof. Budd lays down this work, which has been one of such far-reaching and lasting value to the country and especially to the Northwest. He is particularly well known as the introducer of hardy foreign fruits and the originator of new varieties. No attempt is, of course, made in this brief note to do justice to his most important achievements. Prof. Charles Craig succeeds him, while he devotes his time to the great work of revising "Downing." The notice is of such interest it is produced in full elsewhere.

SOME MINNESOTA HORTICULTURISTS.

Taken at the Annual Meeting of the Minnesota State Horticultural Society, December 9, 1898.

THE MINNESOTA HORTICULTURIST.

VOL. 27. FEBRUARY, 1899. No. 2.

REPORT OF THE RUSSIAN APPLE NOMENCLATURE COMMISSION.

(Meeting held at La Crosse, Wis., Aug. 30-31, 1898. Report made at Annual Meeting Dec. 8, 1898.)

President, CLARENCE WEDGE, Albert Lea, Minnesota.
Secretary, N. E. HANSEN, Brookings, South Dakota.

It is well known to fruit men that the nomenclature of Russian apples imported into the Northwest is much mixed. There are various reasons for this confusion. The scions as originally imported were in many cases mixed, and in Russia itself the nomenclature has not yet been fully worked out for all parts of the fruit-growing sections. To this must be added errors in handling such an immense list of varieties in this country. Also the fact that among the great number of Russian apples are found well-defined groups or families. By this is meant that some varieties so closely resemble each other as to be nearly or quite identical. Slight differences may be apparent in season, quality, size and appearance of fruit, and in habit and other characteristics of tree, but for all practical purposes they are too nearly the same to warrant more than one representative of the group being put into general cultivation. To cut down the list would greatly simplify matters pomological, and the need of it has been long felt.

In order to make a beginning in this work the State Horticultural Societies of Minnesota, Iowa, Wisconsin and South Dakota appointed a Commission, which met in the annex of Hotel Esperesen, La Crosse, Wis., August 30 and 31, 1898. Wisconsin was represented by A. G. Tuttle, of Baraboo, Prof. E. S. Goff, of the State University at Madison, and by A. J. Philips, Secretary of the State Horticultural Society, West Salem. Iowa was represented by J. B. Mitchell, of Cresco, C. G. Patten, of Charles City, and J. Sexton, of Ames. Prof. J. L. Budd, of the Iowa Agricultural College, the highest authority on Russian fruits, was represented by Mr. J. Sexton, who has been his chief assistant for the past twenty-three years. Minnesota was represented by J. S. Harris, of La Crescent, Prof. S. B. Green, of the University of Minnesota, and Clarence Wedge, of Albert Lea. South Dakota was represented by Prof. N. E. Hansen, of the State Agricultural College, at Brookings.

All the members were present except Professor Goff, who was unavoidably detained from attending the meeting. The Commission was called to order Tuesday morning, August 30. Upon unanimous motion Mr. A. G. Tuttle, the senior member of the Commission, was elected temporary President. Mr. Tuttle thanked the members for the honor conferred, but stated that his eighty-three years ought to excuse him from the heavier duties of the meeting. The Commission adjourned to the Inter-State Fair at the La Crosse Fair grounds to inspect Mr. Tuttle's large collection of Russian apples. Upon returning, the work of unpacking sample apples brought by the various members was completed and the Commission was ready for work.

Clarence Wedge was elected President and N. E. Hansen, Secretary. Mr. Wedge thanked for the honor conferred and said that our object is to find out our agreements rather than our differences; to correct the nomenclature rather than to get at their value as varieties.

The following resolution was unanimously adopted as a preamble to the groups or families of apples brought under consideration:

"The varieties here grouped as members of the same families, while in a few cases differing somewhat in characteristics of tree, are so nearly identical in fruit that for exhibition and commercial purposes they are practically the same and should be so considered."

In the following lists the word "spurious" indicates that the name preceding it properly belongs to another variety with which it has been mixed. The word "group" or "type" may be used if preferred for the word "family." The descriptions adopted serve to fix the varieties which have attracted special attention in part or all of the region represented by the Commission. No attempt was made to make a complete report on all the Russian apples. The numbers indicating size of fruit are according to the scale adopted by the American Pomological Society.

In the following lists the heading of each group is the name adopted as the official name for the group.

All varieties sent out from different sources are included to help locate errors and duplicates. The season given is that on the north boundary of Iowa.

THE HIBERNAL GROUP.

Hibernal, No. 378; Lieby or Recumbent, 240; Yellow Arcadian, 327 Juicy Burr, 544 (spurious); Romenskoe, 599 (spurious); Silken Leaf, 75 M.; Recumbent, 41 M.; Zuzoff, (spurious); Pendent Ear; Omensk, (spurious); Romna, (spurious); Ostrakoff, United States Department, (spurious.)

DESCRIPTION: *Hibernal*—Size, 5: form, oblate; color, yellowish green, stripes and splashes of pale red, many white dots; cavity, medium narrow, deep, russeted extending over base; stem, medium; basin, broad, medium deep, corrugated; calyx, half open; flesh, yellowish green, medium fine; flavor, sour; season, early winter; origin, Russia.

O. G. Patten: I find that Pendant Ear is not one-tenth the value of Hibernal with me, because it does not bear, and yet the fruit is the same.

DUCHESS GROUP.

Duchess; Duchess of Oldenburg; Oldenburg; Arabian, 184; Borovinka, 245; White Krim; Anisette, 185; Glass Green.

DESCRIPTION: *Duchess*—Size, 6; form, roundish oblate; color, greenish yellow with red stripes; cavity, regular, medium deep, narrow, light russeted; stem, medium; basin, broad, corrugated; calyx, half open; flesh, light yellow, rather coarse; core, medium, closed; flavor, rather sharp acid; season, August: origin, Russia; tree, medium upright.

A. G. Tuttle: My Glass Green colors up more than Duchess, and keeps its flavor longer than Duchess after coloring. It is a better apple in my experience to grow than Duchess. Of late years I have set Glass Green instead of Duchess, as it is a better tree, and more valuable because keeping its quality longer after coloring.

O. G. Patten: The Anisovka I got from Dr. Regel is distinctly of the Anis family and of very upright habit. Peterson of Wauconia and Reeves of Waverly say that Borovinka is better than Duchess.

S. B. Green: That is J. M. Underwood's opinion.

O. Wedge: Mr. Peterson said his Borovinka was a better keeper, but his Duchess were old decrepit trees, while his Borovinka were young trees.

LONGFIELD GROUP.

Longfield, 161; 57 M; English Pippin, 587; Good Peasant (spurious); 387 (spurious).

DESCRIPTION: *Longfield*—Size, 4 to 5; form, roundish conical; color, shady side yellow with greenish bloom, sunny side yellow and red with small gray dots in skin; cavity, deep, smooth; stem, long; basin, flat, ribbed; calyx, half open; core, closed; flesh, white, fine grained; flavor, slightly sub-acid, aromatic; season, November to January; origin, Russia; tree, strong, spreading, drooping grower, grayish woolly leaves and shoots.

J. Sexton: No. 31 M is the true Good Peasant as received by Professor Budd direct from Moscow, but some Anisim scions were mixed with it, and the No. 387 spurious was simply mistaken for No. 587. We find 31 M hardier than Longfield and a good bearer.

A. G. Tuttle: I have 300 Longfield in orchard, and think it hardier than Duchess and that it will bear more abuse than any tree I know of, not excepting Hibernal. Longfield is a great annual bearer, a good table apple, and the leaf never scabs.

CHARLAMOFF GROUP.

Charlamoff, 262; Peterson's Charlamoff; Champanskoe; Pointed Pipka, 361; Champagne, 112 M. This Charlamoff is entirely distinct from the Charlamoff as grown by J. B. Mitchell and A. G. Tuttle, which is a flat apple of upright habit of tree, and not as valuable as many more of the same season. The Charlamoff of Mitchell and Tuttle it was decided to name Schroeder's Charlamoff. In other words, two varieties have been imported under the name Charlamoff, and this name is now given to the better one of the two.

DESCRIPTION: *Charlamoff*—Size, 5 to 6; form, oblong conical; color, greenish yellow striped and splashed with red; cavity, medium deep, often with large lobes; stem medium slender, basin, deep wrinkled; calyx, nearly closed; flesh, greenish white, tender; flavor, pleasant, vinous acid; season, September; origin, Russia; tree, strong, regular, spreading grower, thick topped; the whole tree has a distinct yellowish green aspect; leaves, large, lightish green with many red veins.

S. B. Green: The Charlamoff grown by Andrew Peterson, of Wauconia, Minn., and hence called Peterson's Charlamoff, is generally a little later than Duchess; tree a spreading grower, with foliage and bark lighter than Duchess; flavor, a mild subacid.

J. S. Harris: I do not think this variety is quite as hardy as Duchess. The Charlamoff of Tuttle is a flat apple, with upright habit of tree, and is too near Duchess to be of special value.

A. G. Tuttle: My Charlamoff is not as valuable as many more of the same season, yet I would put it in my list of the best fifty varieties.

N. E. Hansen: In European nurseries Charlamofsky is a synonym of Duchess.

J. B. Mitchell: I would put Tuttle's Charlamoff in my list of the best sixteen varieties.

C. G. Patten: Peterson's Charlamoff I find makes a large, spreading tree, and bears reasonably young.

S. B. Green: It might avoid confusion to name Peterson's Charlamoff Champagne.

ROMNA GROUP.

Romna, 599; Romenskoe. The large, round, green winter apple as grown by Mr. Tuttle, of Wisconsin, under the name of Romenskoe, will hereafter be known as the true Romna. This settles the matter definitely, as Hibernal has been mixed with Romna as originally sent out from Russia.

DESCRIPTION: *Romna*—Size, 6; form, smooth, round conical, very regular; color, dark green with brownish red on sun side, covered with grayish bloom, thickly sprinkled with large grayish dots; cavity, acute, deep, regular: stem, medium and stout, often knobbed; basin, shallow, narrow, wrinkled; calyx, closed; flesh, white, fine grained; flavor, mild, pleasant acid; season, late winter and spring; tree, spreading, irregular, dwarf.

A. G. Tuttle: Romna is a good apple, but not one of the first dozen varieties that I would plant. It keeps till April or May, but does not get good until April. Tree has an irregular top and is a slow grower.

C. G. Patten: I regard Romna as the most valuable of all the Russians from which to grow seedlings with the hope of getting winter varieties.

J. Sexton: Romna is a fine apple. The tree is spreading and has the largest leaf of any that we have.

CROSS GROUP.

413 Department. The name Cross was adopted as the official name of the No. 413 of the United States Department, which has also been disseminated under the name of Large Anis. It is distinct from Cross 15 M, 8 M, Skrischapfel and Cross Vor, the synonomy of which was not taken up.

DESCRIPTION: *Cross*—(No. 413 Dept.)—Size, 5; form, oblate conical; color, greenish yellow, nearly covered with a light carmine, dotted with green specks, with distinct bloom; cavity, green, broad, deep; stem, medium; basin, well defined, nearly smooth; calyx, large, closed; flesh, light yellow; flavor, slightly sub-acid; season, October to December; origin, Russia; tree very spreading, medium grower; wood, grayish.

A. G. Tuttle: No. 413 Dept. does not blight a particle with me. Chas. Gibb sent me the scions. Mr. Gibb visited me once and looked through my collection. He said I had nearly everything, but should have one or two more, so he sent me Cross and Grandmother.

CHRISTMAS GROUP.

No. 310. The variety grown under the number 310 by Mitchell, Peterson, Green and others, was decided to be the true Christmas.

DESCRIPTION: *Christmas*—Size, 11; form, round, conical, often oblique and slightly angular; color, yellow with red stripes at base and deep clear red towards the eye; cavity, medium, rather narrow; stem, medium; calyx, closed on a flush wrinkled or narrow ribbed surface; flesh, white, fine grained; flavor, pleasant acid; season, December; origin, Russia.

ANTONOVKA GROUP.

Antonovka, 16 M and 236; No. 224; Vargul, 277; German Calville, 324 (spurious); Russian Gravenstein, 105; Bergamot, 424.

DESCRIPTION: *Antonovka*—Size, 6 to 7; form, roundish, angular, flattened at the ends; color, straw yellow, with dots that give the skin a rough appearance; cavity,

narrow, ridged, deep, russeted; stem, medium short; basin, medium deep, ridged; calyx, closed; flesh, yellow, nearly fine; core, nearly closed; flavor, pleasant, acid; season, October; origin, Russia.

J. Sexton: All the above appear alike to me, except No. 105, which is different in tree.

A. G. Tuttle: I do not think there is any difference in them.

J. B. Mitchell: I find Vargul, Bergamot and German Calville more valuable than Antonovka, although very similar.

ANISIM GROUP.

Anisim; 14 M and 18 M of Budd; Zuzoff of Tuttle; Good Peasant of Patten; Borsdorfer of Wragg; Peterson's Anisim; Swedish Borsdorf of Patten. This variety is proving very valuable in Minnesota and other parts of the Northwest, and has been grown in Wisconsin, Iowa and Minnesota under several different names as originally imported from Russia, but which now all give way to the name Anisim.

DESCRIPTION: *Anisim*—Size, 4½; form, roundish, inclining to conical; color, greenish ground nearly covered with a very dark red, with a bluish bloom with minute whitish dots; cavity, medium, slightly russeted, acute; stem, short, medium; basin, sma wrinkled, shallow; calyx, closed; flesh, white, fine grained, juicy; flavor, pleasant sub-acid; season, November to January; origin, Russia; tree, a prodigious bearer; young trees upright, spreading with age; limbs, long, slender, with a very strong shoulder; leaves, narrow, pointed, dark green.

N. E. Hansen: At the agricultural fair at Kiev, Russia, last fall, I saw the true Anisim exhibited under a Russian name meaning "Beauty." I met some of the leading Russian pomologists, who are endeavoring to correct the nomenclature of their apples.

A. G. Tuttle: I find the trees of the true Anisim are strongly shouldered, similar to those of my Rawle's Genet before they winter-killed. Anisim is one of the very best nursery trees grown.

C. Wedge: The shoulder in the Anisim limbs is very characteristic.

GOLDEN WHITE GROUP.

Large Long White, 979, of Tuttle and Mitchell; Golden White, 978, of Tuttle and Mitchell; White Russet, 981, of Tuttle and Mitchell; No. 4, Orel, of Budd; No. 5, Orel, of Budd; No. 56, Vor, (spurious); Winter Stripe; Tuenarius 15, Department of Patten. The name does not describe the apple, but is adopted until the true name can be ascertained.

DESCRIPTION: *Golden White (Nos. 978, 979, 981)*—Size 5 to 6; form, roundish, slightly angular; color, light yellow, striped and splashed with red; dots, white; cavity, wide, regular; stem, short to medium; basin, shallow, slightly corrugated; calyx, half open; flesh, yellowish white; flavor, subacid; season, fall; origin, Russia; tree, irregular grower.

J. B. Mitchell: Nos. 978, 979 and 981 are all alike; the buds are very prominent, thick and woolly. I quit propagating the trees, but people who had bought trees kept coming to me for more, so I began again two years ago.

J. Sexton: No. 4 Orel and 5 Orel are like Mallett 980 in leaf and like the above three in fruit.

A. G. Tuttle: In my neighborhood Golden White is a very good apple.

REPKA MALENKA GROUP.

Repka Malenka 410; Little Seedling; Green Sweet 169, (spurious).

DESCRIPTION: *Repka Malenka*—Size, 4; form, round, conical, angular; color, light green, striped with dull red; cavity, deep, russeted at the bottom; basin, narrow, abrupt, wrinkled; calyx, closed; flesh, greenish white, firm; flavor, mild, sub-acid;

season, January to April; origin, Russia; tree, upright, symmetrical and of rather slow growth.

A. G. Tuttle: Repka Malenka with me bears early and keeps until apples come again. I find it is fully as good a keeper as Little Romanite and a much better apple in quality.

YELLOW SWEET GROUP.

Yellow Sweet; No. 321; Green Sweet of Patten.

DESCRIPTION: *Yellow Sweet*—Size, 5; form, oblate, roundish; color, greenish yellow with bronze blush on sun side; cavity, narrow, acute; stem short, medium; basin, broad, medium deep, slightly wrinkled; calyx, open; flavor, sweet, good; season, summer; origin, Russia; tree, slow, medium upright grower, free from blight, slow in coming into bearing.

C. G. Patten: This is one of the freest from blight and one of the hardiest that we have, and valuable, though a tardy bearer.

TRANSPARENT GROUP.

Yellow Transparent; No. 60; White Transparent; Red Duck (spurious); Charlottenthaler; Enthaler; Thaler; Erdbeer Streifling; Nitchner's Erdbeer.

DESCRIPTION: *Transparent*—Size, 5 to 6; form, round, conical; color, pale straw-yellow, skin showing slightly raised irregular gray dots; cavity, very broad, medium deep; stem, long, rather stout; basin, medium, wrinkled; calyx, open; core, medium, nearly closed; flesh, fine grained, nearly white; flavor, pleasant acid; season August 1st to 10th; origin, Russia; tree, upright, round topped.

A. G. Tuttle: I find this variety profitable for the earliest fancy market, shipped in small boxes.

ANIS GROUP.

Anis; No. 317; 984, Kursk Anis; Red Anis; 32 M; Russian Green; Blue Anis; Yellow Anis; Pink Anis; Striped Anis; Getman.

DESCRIPTION: *Anis*—Size, 4 to 5; form, roundish oblate, angular; color, light green, striped with red in sun; cavity, broad, deep; stem, short; basin, broad, irregular, angular; calyx, medium, closed; core, open; flesh, tender, juicy, greenish white, with dark green water line around core; flavor, agreeable mild acid; season, September and October; origin, Russia; tree, medium upright; fruit drops easily.

A. G Tuttle: I move that all be discarded, owing to small size.

J. S. Harris: I second the motion. However, I think the Russian Green should be retained for very cold latitudes, as it is very hardy, and the tree is blight proof. For milder sections the Anis group is too small.

The following descriptions were adopted of other varieties that have attracted special attention in the Northwest:

LONG ARCADE.

DESCRIPTION: *Long Arcade*—Size, 2 to 5; form, oblate, a little angular; color, greenish yellow, overspread with dark red, numerous inconspicuous fine white dots; cavity, medium broad, acute, russeted; stem, medium long, slender; basin, shallow, broad, wrinkled; calyx, medium open; flesh, white, coarse; flavor, mild, sub-acid; season, August to September; tree, very upright, spreading with age.

BODE.

DESCRIPTION: *Bode*—Size, 4; form, oblate, slightly oblique, a trifle angular; color, greenish white, cavity russeted often over-running light dots; cavity, rather small, medium deep; stem, short; basin, broad, medium deep, wrinkled, wavy; calyx, half open, erect; flesh, white, firm, medium fine; flavor, acid; season, summer.

LUBSK QUEEN.

DESCRIPTION: *Lubsk Queen*—Size, medium to large; form, rather round, flattened at the ends; color, polished waxy white, with bright blush on sun side with numerous fine, irregular gray dots showing through the skin, (a beautiful fruit); cavity, smooth, regular, greenish; stem, medium long; basin, broad, much wrinkled; calyx, closed; flesh, nearly white; flavor, pleasant acid; season, August and September; tree, medium upright, good grower; origin, Russia. Not the Lubsk Queen of Tuttle, which is much like the White Pigeon.

LOWLAND RASPBERRY.

DESCRIPTION: *Lowland Raspberry*—Size, 6; form, round conical; color, orange yellow, striped, splashed and shaded with red, showing gray dots through the color; cavity, medium broad, rather deep; stem, medium; basin, small. wrinkled; calyx; closed or half open; flesh, light yellow, often stained with red, fine, tender, juicy; core, medium open; flavor, sub-acid, good; season, August (as early as Transparent): tree, medium upright, round topped, excellent; origin, Russia.

A. G. Tuttle: There is no early apple east or west of better quality than Lowland Raspberry. The tree is perfect and a good bearer, and the fruit is handsomely colored.

OSTRAKOFF.

DESCRIPTION: *Ostrakoff* (4 M)—Size, 5; form, round; color, yellowish green, shaded brown on sun side, many grayish spots, often covered with blackish fungus spots; cavity, medium; stem, long, thin; basin, shallow, wrinkled; calyx, half open; flesh, yellowish, white, fine; flavor, sub-acid; season, early winter; origin, Russia; tree, a vigorous grower, subject to blight, does best on high limestone and clay soils.

VARGULEK.

DESCRIPTION: *Vargulek* (12 M)—Size, 5 to 7; form, round, conical; color, straw yellow with splashes of red on sun side; cavity, regular, medium deep; stem, medium long; basin, medium deep, wrinkled, abrupt; calyx, closed; core, small, closed; flesh, fine, white, tough, corky; flavor, pleasant acid; season, September 1st; origin, Russia; tree very upright, moderately vigorous, inclined to blight.

C. Wedge: Clemens and Kinne, of Storm Lake, Iowa, think well of this variety. season, September; the tree is very upright.

J. S. Harris: I do not think it of any value as the tree is inclined to blight.

C. G. Patten: Vargulek is a good tree, but the fruit drops badly.

SWEET LONGFIELD.

DESCRIPTION: *Sweet Longfield*—Size, 5; form, oblong, somewhat oblique; color, yellow with blush on sun side, dark dots; cavity, angular, broad, deep, russeted; stem, medium; basin, narrow, shallow, corrugated; calyx, closed; flesh, fine grained; flavor, sweet; season, early autumn; origin, Russia.

J. Sexton; Sweet Longfield we find is a hardy tree and a good bearer. It is a good sweet apple, and worthy of cultivation. The tree is rather spreading, does not resemble Longfield, and the foliage heavier than that of Longfield. It is the name now given to it instead of Kursk Reinette (20 M).

BEAUTIFUL ARCADE.

DESCRIPTION: *Beautiful Arcade*—Size, 6; form, oblong conical, angular; color, light yellow, clouded and splashed with red, often with surface roughened by raised dots; cavity, wide, deep, furrowed; stem, long; basin, shallow, rather abrupt, wrinkled; calyx, half open; flesh, dry, tender: flavor, good, sweet; season, August: origin, Russia; tree, irregular, spreading, open, good grower.

A. G. Tuttle: Beautiful Arcade blights a little on young trees, but not on old trees.

C. G. Patten: It shows much blight with me.

J. Sexton: It blights some at Ames.

ZUZOFF.

DESCRIPTION: *Zuzoff*—Winter Zuzoff of Tuttle—Size, 8 to 9; form, round-oblate, rather angular; color, greenish, nearly or quite overspread with dark red with many

white dots; cavity, broad, medium, deep; stem, short, stout; basin, narrow, abrupt; calyx, small, closed; core, closed, small; flavor, sub-acid; season, winter: tree, upright, good grower, tardy bearer.

ARABSKOE.

DESCRIPTION: *Arabskoe*—Arabskoe of Tuttle—Size, 6; form, round; color, green, overspread with dull purplish red, numerous white dots; cavity, small, deep; stem, short, stout; basin, broad, shallow, wrinkled, strongly pubescent; calyx, closed, small; flesh, white, coarse, loose; flavor, acid; season, winter; origin, Russia; tree blights badly with Mr. Patten.

SWITZER.

A. G. Tuttle and C. G. Patten reported that their trees had blighted to death. It appeared that, while esteemed by many growers in the East, it was too subject to blight in the Northwest. It was thought that Switzer should be struck off the list recommended by the American Pomological Society for planting in the Northwest, and this opinion was ordered sent to the society for action at the next meeting.

A WISCONSIN LIST.

A. G. Tuttle named the following as the best six of those he has tested, the varieties being in the order of their value: Longfield (a great annual bearer), Anisim, Antonovka, Beautiful Arcade (for sweet), Lowland Raspberry (for best early quality), Repka Malenka (for late keeping).

A MINNESOTA LIST.

The Minnesota State Horticultural Society varies this list. At their December meeting only three varieties were recommended for general cultivation, Duchess, Hibernal and Charlamoff, with Anisim, Longfield, Christmas, Yellow Sweet, Cross and Repka Malenka for further trial.

The general consensus of opinion of the Commission tended strongly in favor of a short list, especially Hibernal, Duchess, Charlamoff, Anisim, Yellow Sweet, Repka Malenka, Longfield, Cross and Christmas. This will simplify matters for the average planter.

Meanwhile a host of seedlings have arisen all over Wisconsin, Minnesota and Iowa since the hard winter of 1884–85, and are attracting favorable attention, and it will take another winter such as that of 1872–73 and 1884–85 to weed out the list and test their true hardiness as compared with imported varieties. This will clear the horticultural atmosphere and make the task of the fruit grower an easier one, in the matter of choosing varieties both native and imported.

The Commission, on motion, adjourned subject to call.

THE AIM OF THE COMMISSION.

The work of the Commission was not to recommend varieties for any particular locality, as that must be left to the state and local horticultural societies, but to revise and simplify the nomenclature of the varieties that have come into chief prominence in various parts of the Northwest. As opportunity permits the work of revision will be continued.

N. E. HANSEN,
Secretary.

Prof. N. E. Hansen, (S. D.): The report is now in the hands of the printer—would be altogether to voluminous to read here.

Mr. Wedge: I do not believe there is any necessity for reading that report. It has been published in our report, portions of it, although there would be some valuable discussion brought out if the report was presented. I think work of this kind might be of great value to kindred societies of the Northwest that are in this particular section. I think when the Dakota societies become organized and we have occasional meetings of representatives from the Northern Iowa societies, Minnesota society and Dakota society, it will be of great value in helping us classify or systematize our seedlings, and also, perhaps, native plums that originated in this section. I have thought that some such meeting as this might be of great value to horticulture in the Northwest if held occasionally, say once in two or three years.

The President: I think the work has been done well, and it is a work that will be of great value to the Northwest. The work has been very carefully and systematically done, and it is a step in the right direction.

Mr. Wedge: There is a question in my mind whether we ought not as a society in some way to adopt this report. If it is the opinion of the society that the work has been well done and properly done, we ought to adopt it as a matter of authority from this association. If any other society should adopt this report it would have no special authority as a matter of reference. We had hoped to do a work which would be an authority and reference on nomenclature, especially in regard to Russian apples.

Mr. Elliot: We have full confidence in that committee, and I think they would make no recommendation that is not good.

Prof. Hansen: I will say that the whole report will be published in the [illegible] urist."

KEEPING APPLES SOUND ALL WINTER.—Take fine, dry sawdust, preferably that made by a circular saw from hard wood, and place a thick layer on bottom of barrel, then place a layer of apples, not close together, and not close to the sides of the barrel. Put sawdust liberally over and around, and so proceed until a bushel and a half or less are packed in the barrel. Keep in a cool place. No bruised or mellow apples will be preserved, but they will not communicate rot to the other apples. This is an easier and quicker way than to wrap each specimen in paper, and the apples would bring fancy prices in the late spring.—*Emma Clearwaters.*

THE WORK OF AN IMPROVEMENT LEAGUE.

MISS LUCIA E. DANFORTH, NORTHFIELD.

The work of an improvement association is both suggestive and executive, both preventative and remedial; but it is more suggestive than executive, and more preventative than remedial. It must work through individuals, through city councils and through the legislature.

One of the most important of its departments is that of forestry, having as its object the saving of individual trees of marked beauty, groves and woods near town and our oak and white pine forests. The one thing which improvement clubs and individuals are especially interested in now is the saving of the Cass Lake reservation for a state park and sanitarium. It has a fine growth of white pine near a very pretty lake, and is accessible by railroad. It is one of the very few pieces of white pine now left in the state, and the benefit of the pine cure in cases of pulmonary weakness, and even consumption, is well known, as well as the value to the state of the citizens who are attracted here because of its importance for sufferers from those diseases.

Leaving out all sentiment for our forests and their great beauty, shall we deprive our invalids of the one place possible of access to those with slender purses? But unless our legislature decides this winter to buy this Cass Lake reservation for the state, it will be sold to private individuals, the trees will be cut and the beautiful forest lost forever to the state. Even economy favors buying this forest, for it is estimated that tourists bring to New Hampshire $6,000,000 a year. Minnesota, if she does not sell her birthright, may in time bring in correspondingly large amounts.

Already 4,000 of the 12,000 lakes of Minnesota have dried up, largely by the cutting of our forests, our rivers are lower, our droughts are greater. Let us save what we can now.

Something can be done in the way of saving beautiful groves near our towns, and can be done more easily by an association than by individuals.

As to special trees, in Northfield, the town of whose association I know the most, a particularly beautiful elm near St. Olaf's College has been saved by the city council, who voted to have it sacred forever. After that, an iron fence was put about it by the students of St. Olaf's. A little tactful persuasion will often save the life of a tree, and the saving of our trees is pathetically necessary.

Besides the saving of our forests is the saving of our bluffs. Perhaps some of you have seen the beautiful Ramenecha, or, as it is commonly called, "Barn" bluff, at Red Wing. It is as beautiful and remarkable as the Acropolis at Athens or Arthur's Seat at Edinburgh, and is the one thing which distinguishes Red Wing from all other cities. Some years ago, its owner generously offered it to the city with some slight conditions. There was no improvement association in Red Wing, and because of this and the lack of any other organization of similar purpose, nothing was done with the offer, and on the death of the owner it passed into other hands,

and now Ramenecha, the glory of Red Wing, is being cut down for lime stone.

Village improvement associations also save natural parks, pictured rocks and other natural beauties. As to their remedial work.—They have hideous and disfiguring signs removed from buildings, trees and fences. They have in Northfield been aided by the city in keeping the grass cut and the streets cleaned. Three times during the summer, the city has all the grass in the streets cut, and on "cleaning-up day" it has a team go about with a wagon to collect tin cans, old boots, etc., which the owners will take out for removal. They have a river bank committee, which tries to have the unsightly and unsanitary rubbish kept off the banks of the very pretty little river. They have park committees, through whose efforts a depot park has been made, where of old were tumble down sheds. It is not yet a very beautiful park, but it has grass and trees started and a fountain, and it will some day be very attractive. One enthusiastic member persuaded a mill owner to remove an old shed sign-depository and has had the ground sodded and has planted a rose bush and vine there, and though it is not much larger than two good sized dining tables, it makes by the mill a pretty spot of what was once an eyesore. One member of the association, when she goes into the country, takes vines which she plants by ruined mills and stone piles or any other available object which could be thus beautified.

□The children's work is very important. Large colored placards have been printed as follows: (For copy of this, see page 27 of January, 1899, Horticulturist.)

. These placards were put in school rooms, talks were given on the subjects, and the children took great interest in living up to the counsel. Afterwards, the teachers increased the interest by having essays written on "What I have done to carry out improvement principles."

Of course, the clubs encourage the observance of Arbor Day. They urge every owner of a "lot to sell" to plant trees and shrubs on the lot. No one wants to build a house and wait for years before his lot is attractive. A beautiful tree will say "This lot for sale" to every passer-by, where the wooden notice on a bare lot containing nothing but sandburs will be passed by with only a shiver of repulsion.

In some cities, neat iron boxes are placed on street corners for the purpose of holding paper, orange peeling and other similar articles. A combination settee and box is being agitated in some places.

The improvement society urges people to have too much respect for nature to ever throw picnic papers and egg shells away in the woods or when lunching on grounds in the country.

The committees of the association are, forestry, street, finance, railroad, humane, prevention of cruelty to children, prevention of cruelty to animals, preservation of natural beauties, children's auxiliary, cemeteries, river banks, membership and sanitation.

In these days of women's clubs, it must be explained that this is a club for both men and women, and the officers are usually men.

There is, however, a committee of the Woman's Federation, which is engaged in just this work. Any man or woman can start an association, and the need of them is great.

As we look about us at our own state and see its constant loss of natural beauties, we are reminded of stern Cato, the censor, who never entered the senate without saying "Delenda est Carthago! Delenda est Carthago!" There are hundreds and thousands of people who seem to be saying, "Our trees must be destroyed, our forests must be destroyed, our bluffs must be destroyed, our lakes must be destroyed." The village improvement association says, and not yet hopelessly, "These things must be saved."

Mr. Hartwell, (Ill.): So that is what the Women's Auxiliary is going to do.

The President: Yes, that's it.

Prof. Pendergast: When I first heard of the Women's Auxiliary I asked the same question my friend on the left did. Since these papers have been read the question has been fully answered. It reminds me of two classes of justices of the peace. When I was a boy in New England the governor appointed the justices and out of a very large number appointed from the whole state he selected a few who did higher and more important work than the rest. They got certain cases that the others did not get. One class was called justice of the peace and the other justice of the peace and quorum, meaning "of which ones." After he had selected a large number of justices and quorum he selected of those certain other ones with higher attainments, better versed in the law, to do higher and grander work. We are all members together, men and women in this society, but out of the whole number we are selecting those that have the best preparation for the work, to carry on the best part of the business we are trying to follow, and so we may say they belong to the "justices of the peace and quorum." (Applause.)

The President: I am sure we are glad to join with Prof. Pendergast in paying that tribute to the Women's Auxiliary—they do not want to be called "ladies," but "women." I am sure they will not disappoint us in our hopes and expectations.

Mr. Barnes, (Wis.): I would like to say Godspeed to the Women's Auxiliary, and I would like to move you that we pledge our support to this society by at least a rising vote for a compliment.

A rising vote of support was then tendered the Women's Auxiliary amid enthusiastic applause.

Mr. Elmer Reeves, (Iowa): If there is time I would like to offer just a remark or two. I presume the ladies, or women

(excuse me), who have started this movement have fully and thoroughly studied this matter and realize the importance of the movement. It takes some of us slow thinkers at least two thinks to fully understand the importance of this work. The matter of village improvement is a very important one, and I look upon this whole movement as a means of bettering all of us, and it can be carried to an extent that few of us can realize. I say Godspeed to the women, and I hope you will not limit the operations of this society to the state of Minnesota, but let it extend south to Iowa and the rest. (Applause.)

EVERGREENS FOR THE ORCHARD.

MARTIN PENNING, SLEEPY EYE.

I planted my first evergreens in the year 1874. My observation on evergreens for a windbreak for the orchard is based on the last fourteen years.

My first observations were made in Wisconsin, in 1884. While I was in Wisconsin, I visited numerous orchards. One orchard of ten acres took my fancy. One row of evergreens was planted around this orchard, ten feet apart. The apple trees were planted in rows running east and west, sixteen feet apart. Two rows of apple trees, then one row of Norway spruce; two rows of apple trees again, then one row of balsam, etc. The whole orchard was a beauty.

In 1886, I planted 3,000 evergreens, Norway spruce, balsam fir, Scotch pine and white pine. I planted them in my garden, which contained three acres at that time.

I had on the south side eighteen Duchess apple trees growing, and my evergreens were planted within four feet of the apple trees. I intended to take them away and sell them soon. Those that were planted close to my apple trees were the Scotch pine. I sold the best of them; part remained on the place for eight years. The apple trees were growing finely and bore apples. The evergreen is by far the best tree for windbreak for the orchard.

In 1888, I planted two acres in orchard. They were mostly plum trees. I planted arbor vitae, Norway spruce and balsam fir for windbreak. They are planted eight feet apart. All are fine looking trees.

In 1895, I planted two acres again. I planted Norway spruce on the east and south sides; on the west side, I planted red cedar, which I consider the hardiest and best for the open prairie. They grow about as fast as any evergreen if cultivated.

I have now on my farm, seven acres in garden, small fruit and in orchard. I planted only evergreens for windbreak. The evergreens are an ornament, and improve the farm ten-fold for the outlay. I recommend planting evergreens for the orchard for windbreak.

THE ART OF ORIGINATING VARIETIES OF STRAWBERRIES.

CHARLES F. GARDNER, OSAGE, IOWA.

Mr. J. M. Merrick, a noted eastern horticulturist, says: "The seeker for new kinds may go to work in two ways, viz.: by hybridizing and by direct planting."

The process of hybridizing the strawberry is simple and not very difficult. It consists essentially in impregnating the blossom of one variety with pollen from that of another, so that seedlings resulting from the seed thus crossed shall partake of the nature of both parents.

In practice, it is convenient that the plant to be fertilized should be a pistillate variety, for in this case we can make absolutely certain that it is not self-fertilized, and shall not be plagued by lingering doubts as to whether we succeeded in removing every anther before its pollen ripened or had a chance to do its work.

The pistillate plants selected for experiment should be isolated from all other kinds and from one another; and this is best effected by covering them with a box or frame. The staminate, or male, plant having been fixed upon, its blossoms should be watched, and when they are fully expanded, and the anthers shed abundant pollen on being snapped or jarred, the whole flower may be cut off, and its anthers shaken over the stigma of the pistillate flower, or the anthers may be very gently rubbed upon the stigma itself.

It sometimes happens that we desire to experiment with a new variety whose flowers are too valuable to be totally sacrificed. In that case, a few of the anthers may be cut off with a fine pointed pair of scissors and conveyed to the pistillate plant on a dry slip of smooth paper.

If both varieties on which we work have perfect flowers, the task is more difficult. Every anther must be removed with the utmost caution and delicacy from the blossom of the plant we desire to fertilize before the pollen has ripened or has had a chance to reach the pistil.

It is best to watch the flowers with patient care, and as they show signs of expanding to unfold the petals prematurely and immediately remove the anthers. This operation is best carried on in the middle of a warm, sunny day, when every part of the flower is dry.

If unhybridized seed is to be planted, the vines that produce it should be the strongest and most vigorous of their kind, and should be limited to one berry each, generally the central one produced by the first blossom, all others having been cut off.

The berries that are to furnish seed, whether crossed or not, should be allowed to get fully ripe before they are gathered. As soon as picked, they should be crushed and mixed thoroughly with a hundred times their volume of clean, dry sand, to absorb the juice and divide the seeds evenly among the mass. A bed of deep, very rich and dry soil having been prepared, the sand and seeds mixed should be sprinkled over the surface, very lightly raked in, the soil thoroughly watered and a frame and sashes put on over the whole.

If the planting be made during the first half of July, young plants may be expected to appear during the first week in August if the sashes have been kept closed and the soil well wetted every day. As soon as the young plants appear in numbers, they should be shaded. This is best done by whitening the glass. The frames may then be kept closed a good part of the time, and the seedlings will grow so vigorously that they will bear transplanting in a few weeks to the bed where they are to remain and fruit.

This method is well adapted for bringing seedling vines into bearing in the shortest possible time, as they get a very strong growth the first year.

Another way, involving even less trouble, is this: sow the mixed sand and seed on a bed of rich soil in July, rake it in lightly, putting on no sash at all. A few seeds will germinate in August or September, but by far the greater number will come up the next spring. and should be thinned and transplanted as soon as large enough, In either case, the young plants must be protected at the approach of winter by a good covering of leaves or straw.

The seedlings should be transplanted into beds of rich earth, encouraged to make stout, stocky plants, and to this end they should not be allowed to make more than two runners.

The seedlings may be set in the bed where they are to fruit, in rows two feet apart, with the plants eighteen inches asunder in the rows. All vines whose leaves burn, or suffer from sunscald, may be profitably pulled up and thrown away before they fruit. Many seedlings that are perfectly healthy are pulled and destroyed by the experienced grower before they fruit.

As the fruit on the seedling begins to ripen, it should be closely watched from day to day, and its progress noted. When fully ripe it should be tested and marked, not absolutely as good or bad, but comparatively, by reference to some standard kind. If a seedling seems worthy of preservation, it should be encouraged to make runners, several of which may be easily obtained, and these carefully transplanted as soon as possible will give a little bed of the new variety for more liberal testing the next year.

No seedling should be preserved which is not healthy, vigorous and productive, its fruit large, of uniform size and symmetrical shape, with few small berries, bright colored and firm, not too acid, and with as high a flavor as possible. Almost all these good traits are united in some berries we now possess, so that our ideal strawberry is not an impossible one.

Mr. Wedge: I am very much interested in that paper. I am not much of a seedling man. A few years ago I tried to grow some strawberries in the way Mr. Gardner suggests. It is very interesting. I was interested in noting that while those I used in the experiment were the Lovett, that two-thirds of the plants resulting were pistillate. Is that Mr. Gardner's experience with staminate varieties?

Mr. Gardner: My experience is that you cannot tell anything about the plant grown from the seed. You may plant

seed from pistillate or staminate varieties, and they will come up staminate or pistillate, all mixed up. I do not think any one can fortell which way it will run. I think Prof. Hansen has had experience in that line. In my experience they sometimes run one way and sometimes the other, and I do not believe it is possible beforehand to tell which way they are going. If you plant, for instance, a perfect flowering variety, if the seed is taken from a berry of a perfect flowering kind, you are just as apt to get two-thirds pistillates, and if you plant seeds from pistillate varieties you are apt to get staminate plants.

Prof. Hansen: My experience and the observations I have made correspond with those of Mr. Gardner. You cannot tell anything about it. The bees have been too busy with the blossoms of former generations, and heredity goes back further than our work. At Ames several years ago we crossed the wild strawberry from Manitoba with the Bederwood and the Warfield both ways, and we could not establish any rule at all.

Mr. Hartwell: While the professor is on his feet I would like to ask him a question. I spent most of my life as a pedagogue, and I am not so familiar in this line of work as I might be, but as a grower it has occurred to me that doubtless there are types of strawberries and those types are so well defined that it might assist an originator in making his selections. I would like to have him give us the history of the strawberry, and what was the origin of those types. For instance—those of you who are familiar with it—there is the Longfellow, which has dropped out of the market. It was a dark red berry, a long berry, from which it probably took its name, but it seemed to have the Warfield type of color and something of the foliage. Capt. Jack has the same type, the dark color and the foliage, the foliage being of very large size, while the Warfield has the type of the Crescent, and having the type of berry of which, possibly, the old Charles Downing was a specimen of. The Clyde is something of the class of the Ruby. The question is, so far as its being of value is concerned, could we follow these types in the development of new varieties? What I want to know of the professor is if he can give us the history of the varieties from their origin. I believe some of these berries are importations brought from other parts of the world, while others have been developed on native strawberries.

Prof. Hansen: The history and development of strawberries is a subject too exhaustive to take up. The general opinion is that our strawberry came from the wild strawberry of the east and was fertilized with the wild strawberry of South America. It got its hardiness from the east and its size from South America, and since then the two species have become so intermingled that it is difficult to say how much of South America is in a berry or how much of the native berry. It is practically the same thing; you find in berries of eastern origin that a type of the western berry is suggested. We find that Hovey's Seedling in 1834 was the first fertilized with the wild berry or with the South American species, but it failed in the west; so thirty-five years ago Mr. Downing, of Kentucky, took up the western type and accomplished something like the same thing, so that our berries that have succeeded in the west are our western type. There is a similarity in a great deal of testimony on this point.

Mr. Hartwell: Is there any European blood in our berries?

Prof. Hansen: I doubt it. Take the strawberries of the Continent and of England, and they would be of no value here. The strain grown in Europe would not be hardy here. The point we want to bear in mind is, so far as the history of the strawberry is concerned, to take only those best varieties that we know succeed in our particular part of the country. We want to avoid by all means the pure South American type. There is no hardiness, no size and no quality.

ANNUAL MEETING, MINNESOTA STATE FORESTRY ASSOCIATION.

G. W. STRAND, SECRETARY, TAYLORS FALLS.

On January 10th the twenty-third annual session convened in the county commissioner's rooms in the court-house at Minneapolis. President Owen being unable to be present, owing to sickness, Capt. J. N. Cross called the meeting to order. A few opening remarks were made referring to the growing interest being manifested in forestry matters and calling the attention of the association to the efforts being made by Col. J. S. Cooper, of Chicago, towards the establishments of a national park at the headwaters of the Mississippi.

Reading of the secretary's record was dispensed with and a motion prevailed that before taking up the papers the "Cross bill," as it passed the senate two years previous, be considered. After considerable discussion on the bill and some amendments offered by Gen. Andrews, it was decided to re-introduce the bill with a few

minor changes, and a committee of three—Col. W. P. Allen, Gen. C. C. Andrews and Prof. S. B. Green—was appointed by the chair to look after it.

Prof. Fernow's valuable paper on "The Forestry Movement in New York and Its Application to Minnesota" unfortunately did not arrive until the close of the session.

"Utilizing Our Waste Lands for Forestry Purposes" was the subject of a very interesting paper presented by Gen. C. C. Andrews, and denoted that he had given considerable time to its preparation. The basis of the plan being one specially outlined by Prof. C. A. Schenck, superintendent of Geo. W. Vanderbilt's extensive forests at Biltmore, N. C.

The program of the afternoon session was carried out as arranged. Prof. Green's paper on "What about a Forestry School in Minnesota?" called forth considerable discussion as to the disposal of university lands and timber, and the opinion prevailed that an arrangement should be made whereby some desirable tract within easy reach of the railroad, such as the one referred to at Vermillion Lake, be held as a demonstration forest. A resolution to this effect was presented by Mr. Ayres, of Carlton, and adopted, recommending to the Board of Regents that a tract of original forest be obtained or set aside to illustrate the principles of forestry.

The next paper on the program, "Native Coniferous Evergreens of Minnesota," by D. A. Gaumnitz, of the School of Agriculture, created a lively debate as to the merits and distribution of several of the varieties mentioned. Spruce received the greatest attention and was looked upon as being of more value even than the white pine.

As there was considerable business to come before the meeting, no discussion was permitted on either of the excellent papers presented by H. B. Ayres on "Variations of Tree Growth," or on the practical demonstration of "Tree Planting on the Prairie Farm" by C. L. Smith.

After the secretary's report on the work of the year and the financial statement had been submitted, the election of officers was proceeded with, resulting as follows:

President—Capt. J. N. Cross, Minneapolis.
Secretary—Geo. W. Strand, Taylors Falls.
Treasurer—R. S. Mackintosh, St. Anthony Park.

VICE PRESIDENTS.

First District—Wm. Somerville, Viola.
Second District—Alfred Terry, Slayton.
Third District—O. F. Brand, Faribault.
Fourth District—W. P. Allen, St. Paul.
Fifth District—S. M. Owen, Minneapolis.
Sixth District—Asa Paine, Carlton.
Seventh District—O. A. Th. Solem, Halstad.

EXECUTIVE COMMITTEE.

Col. J. H. Stevens, Minneapolis; A. W. Latham, Minneapolis; J. S. Harris, La Crescent; Prof. S. B. Green, St. Anthony Park, and H. B. Ayres, Carlton.

A number of resolutions were offered and adopted, embodying: First, a vote of thanks to the county commissioners for the free use of their rooms. Second, commending the course of the Board of Regents of the University in deciding to ask the legistature for an appropriation of $35,000 for a building for Horticulture, Forestry, Botany and Physics for the School of Agriculture. Third, expressing appreciation of interest in and of the assistance rendered the society in the past by Col. Stevens and tendering sympathy in his serious illness. Fourth, instructions to the secretary to prepare and forward suitable resolutions of thanks to the retiring president, Hon. S. M. Owen; and also one in remembrance of the efficient services rendered by the late secretary, J. O. Barrett. Fifth, commending the work of Gifford Pinchot, chief of the United States Division of Forestry, in authorizing a forest survey of Minnesota.

Article XI of the constitution was amended so as to leave the time and place of meeting with the executive committee instead of a fixed date, and undoubtedly the association will hereafter hold its annual session in connection with that of the state horticultural society.

THE MINNEAPOLIS MYCOLOGICAL SOCIETY—ITS OBJECT AND WORK.

W. M. BABCOCK, MINNEAPOLIS.

At your last meeting, a paper was read by Dr. Mary Whetstone on "The Mushroom as a Food," which was printed in the July number of the Minnesota Horticulturist. Since then, a society has been formed in this city for the purpose of studying and making use of the mushroom, that excellent food product, growing so abundantly about us and yet so little known. It is my purpose to tell you something of the work and aims of the society.

In the first place, the object of the Minneapolis Mycological Society is the study and classification of mushrooms, popularly called toadstools.

Second, the testing of edible ones and gathering them for interchange among the members of the society and other persons interested, as well as their exchange with other societies having similar aims.

Third, experimentation on the best methods of preparing and cooking such as we find to be edible.

Fourth, and most important of all, spreading the knowledge acquired among the public, and inducing people to try the different varieties known to be fit for food.

It is on account of the latter aim that I come before you today. We want you to know that there is a society in this state whose purpose it is to introduce and spread the knowledge of the mushroom as a food product. To do that we desire your assistance. We live in the city; most of you live in the country, with fields and woods to surround you. You live near the home of the mushroom; we have to make special trips to find them. We want your co-operation; we want you, when you find specimens that you have the least doubt about to box them up, packed in soft paper and send

them to us for identification and study. We will try and classify them and report back to you, and if edible will tell you how to cook the mushroom sent. Should you chance to like it, and most persons soon become mushroom eaters, as well as mushroom students, you gain a new, wholesome, easily procured, delicious food for your table.

Right here, let me caution you. Do not try to eat any doubtful specimen until you are positively sure that it is suitable to be eaten. While it is true that the dangerously poisonous species are few in number yet they contain the most beautiful of all mushrooms, but their poison is practically fatal in its effects, unless promptly handled by some competent physician. To the poison contained in some mushrooms, as yet no antidote is known. Let me add further, that there is no single infallible, simple test known to the mycologists.

Send us, not one specimen of a kind, but half a dozen, the youngest in the button stage, as well as others, including partially decayed ones. Send us the whole plant including the root, if any. Write us, telling us where you find it, whether on the ground or on a tree or stump, whether on dry or wet land, in the woods or the meadow. Give its color, as nearly as you can, when fresh; state whether the cup was watery or dry to the touch. The more of these items you can give us, the better we shall be able to classify your specimen. We will not guarantee to name it, even with the best description, as we ourselves are comparative beginners, and it is a difficult study even at the best.

You may ask "Are there many edible kinds?" To this I answer, yes. One of our members has sixty-four different kinds of mushrooms, found around St. Paul. Captain McIlvaine, one of the greatest living authorities on mushrooms, has eaten over four hundred and fifty different kinds. At a mushroom supper recently given by the society, we were served with mushrooms, prepared in seven different ways. They can be baked, boiled, stewed, fried, broiled, scalloped and be used as a salad.

If I have interested you in the subject, let me tell you how we work. We meet one evening a week during the season, each member bringing such specimens as he or she may have found during the week. These are spread out on a table for exhibition and study. If a specimen is known positively to any member, it is named, and the others attempt to fix the name in their memory or write it down in their note books, so that they may recognize future specimens of the same kind. If not known, some member of the committee on classification takes up a specimen and, if possible, analyzes it at once for the benefit of the rest. If not possible at that meeting, it is taken home and analyzed before the next meeting, and a report is made.

It may be that while the mushroom may not be known at the time as an individual, yet its family is known, and experience has shown that the entire family is harmless; in such case, the specimens are distributed among the members for a careful culinary test and report. Perhaps at the next meeting there follows an interchange of the results obtained from cooking the specimens in different

ways, and records are kept by the secretary of the receipts used Information is given out where edible mushrooms of different kinds are to be found. We are told where to look for them, at what seasons of the year they may be expected. In the future, we intend to make occasional excursions for field study, and it is the hope of the club, as it grows in strength and membership, to collect and preserve in alcohol, or other preserving fluids, fresh specimens for exhibition at the state fair. We are also gathering a library of scientific books on the subject, and occasionally the club gives a mushroom supper at which different varieties are cooked by the members, gentlemen as well as ladies taking a hand in their preparation.

Visitors are welcome at our meetings. We are in correspondence with other societies of similar aims, such as the Philadelphia and Boston mycological societies, who were the pioneers in this work.

Perhaps a question may arise in your minds "How do you dare try an unknown specimen?" I answer, we do not, until we know its family and, further, that there are no poisonous members of that family.

From our study of scientific authorities on the food subject, we first learn to identify a mushroom positively before we test it as a food product. If we are at all uncertain about our identification, we send the unknown specimen, properly packed, to either Captain McIlvaine or the Boston Mycological Society, where they have experts employed for the purpose.

We shall be glad to have any and all of you become either active or auxiliary members of our society, and we can assure you that it will be to our mutual benefit, by giving you a new and easily obtained food product and us the greater facility for study. The advantage will be reciprocal. Should you not care, at first, to become members, visit our meetings and spend an instructive and pleasant evening with us, and you will receive a most cordial welcome.

NOTE:—All communications may be sent to Mrs. Dr. Whetstone, 408 Nicollet avenue, Minneapolis, Minn.

THE SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

R. PARKHILL, SECRETARY.

In an article in the November Horticulturist on the organization and growth of the Southern Minnesota Horticultural Society, the former secretary, Mr. Clarence Wedge, of Albert Lea, modestly omits to mention the active part taken and the good work done by him in caring for and encouraging this society from its small beginning until the membership roll reached one hundred or more

About one year ago, the Fillmore County Horticultural Society accepted a cordial invitation from the Southern Minnesota Horticultural Society to hold a joint meeting at Austin, and at that meeting the younger society proposed, was accepted, and the marriage ceremony was then and there solemnized. The counties of Freeborn, Mower and Fillmore now form the territory of this society, the annual meeting being held in rotation at Albert Lea, Austin and Spring Valley.

Our society keeps in close touch with the horticulturists of northern Iowa, who cheerfully give their help in our annual meetings.

The inducement given by our State Horticultural Society, in requiring only a nominal membership fee from members of local societies, encourages all of our members to join the parent society.

Only a few of our members can attend the meetings of the State Horticultural Society, but all can come to the meetings of our local society, and all can enjoy a monthly feast of good things in the pages of the "Minnesota Horticulturist."

Our society does not attempt to hold a summer meeting, but aims to arrange a comprehensive and practical program for our annual meeting, and then makes an effort to get the people to come. If they *come*, they are sure to become interested and *stay* as members.

To encourage apple growers and bring out a good display of the king of fruits at our annual meeting in January, at Spring Valley, liberal premiums have been offered by the Wedge Nursery, Morgan & Sons Nursery and also by our society.

The ambition of our society is not only to interest and encourage the people of our territory, so that they may realize and take advantage of the possibilities of this part of the state as a fruit country, but also to educate and ground them in the true principles of horticulture, so that this corner of our great Minnesota orchard shall be a "banner waste" for the large army of frauds who give in return for good money, only disappointment, discouragement and *worthless nursery stock.*

ANNUAL MEETING, 1899, SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

R. PARKHILL, SECRETARY, CHATFIELD.

The sixth annual meeting of this society was held January 18 and 19, 1899, in Armory Hall, Spring Valley.

The attendance during the day sessions reached as high as 140, and an audience of about 350 enjoyed the evening session.

Our state society was well represented at the meeting and on the program by J. S. Harris, Prof. S. B. Green and E. H. S. Dartt.

J. H. Upton, Cresco, Ia., represented the Northeastern Iowa Horticultural Society, and C. G. Patten, J. B. Mitchell and A. E. Bente, prominent horticulturists from northern Iowa, were present and took an active interest in the meeting. The visiting friends from Iowa were welcomed as honorary members of this society for the ensuing year.

The apple exhibit was of varieties kept in cellars, no cold storage fruit being allowed to compete. In all 132 plates were shown by ten exhibitors.

A few of the speakers failed to attend, but a full program brought out the fact that President Hawkins is a model presiding officer.

The opening address by President Hawkins was very encouraging, helpful and bristling with valuable suggestions.

In a paper on "The Horticulturist a Public Benefactor," Jonathan Freeman showed how the horticulturist gave freely of his time and willingly gave the public the benefit of his knowledge and experience.

The apple was given considerable space on the program, and the lively discussions following the papers on this topic showed the great interest taken therein.

In a paper on "The Ideal Winter Apple," Clarence Wedge pictured the necessary good qualities of fruit and tree in a winter apple for the northwest so plainly, that, indirectly, the fact was brought out most emphatically that we had not yet realized our hopes in this direction.

F. W. Kimball presented "Some Difficulties in the Way of Producing a Winter Apple," and while realizing the knotty problems to be solved, yet felt sanguine that a solution would be found.

A paper on "The Commercial Apple Orchard," by D. K. Michener, gave facts from the experience of the writer which proved that while fall varieties formerly found ready sale at good prices, yet the time had come when winter apples must be given first place in planting an orchard.

"A Few DON'TS for Beginners," by C. Morgan, was a practical paper giving much good advice to beginners in the fruit business.

Prof. S. B. Green, in a very able address on "The Most Promising Material on Hand for Present Planting," offered many valuable suggestions, and gave a general fruit list which he recommended for planting in southern Minnesota.

E. H. S. Dartt, in a paper on "Controlling Fruit Trees," presented his views on *girdling* and favored controlling fruit trees by this method.

The following "snap shots" were taken during the discussions on apple topics:

J. B. Mitchell—"I do not know of a hardy winter variety and a long keeper, the Repka Malenka, perhaps, excepted. I believe the coming apple will be the result of a cross between a *hardy tree* and a *long keeper.*"

C. Morgan—"I consider the Wealthy the best all round apple for this section, and if limited to one variety, I would plant Wealthy."

E. H. S. Dartt—"I am growing 1,000 varieties, and perhaps the coming apple is among them, but I do not know which one. Phoenix No. 50 is the most promising new seedling. It is a large apple, tinged with red, and will keep till spring."

C. G. Patten—"I do not believe that a first-class apple can be produced from the Russian varieties. We must conform to certain laws and confine ourselves to the best kinds that have been developed in this country."

J. S. Harris—"We have many so-called winter varieties, but I know of only a very few late keepers on a hardy tree."

C. Wedge—"I have been much impressed with the prepotency of some varieties—Dartt's Hybrid and Wealthy, for instance. It is a well known fact that seedlings from some varieties are quite often sure to show a marked resemblance to the parent apple."

Our enthusiastic champion of small fruits, E. F. Peck, read a paper on "Culture of Strawberries and Raspberries." He favors the "hill" system and believes in using wood ashes as a fertilizer.

"Sunshine and Flowers as Friends for the Shut-ins," by Mrs. J. Freeman, was an inspiring paper on this topic.

A large audience was present at the evening session. An eloquent address of welcome by Dr. Walker was responded to by Clarence Wedge. Music and readings by talented citizens of Spring Valley were enjoyable features of this session. A paper on "Nature God's Picture Book," by Miss Lena Freeman, was well received. E. H. S. Dartt read an original poem, "The Pioneer," which created considerable merriment and called forth much applause.

A very interesting feature of this session was the reading of the essays on "How to Plant an Apple Tree," written by boys and girls under sixteen years of age. The first prize essay being read by the author, Miss Irene E. Warren, Spring Valley.

A vote of thanks to the citizens of Spring Valley who had kindly assisted on the program, and a parting song by the high school male quartet, concluded the proceedings of this session.

The report of committee on fruit list was adopted as follows:

APPLES.

Of the first degree of hardiness for planting in Minnesota: Duchess, Hibernal, Charlamoff.

Of the second degree of hardiness: Wealthy, Longfield, Tetofsky, Malinda, Patten.

Promising varieties for trial: Okabena, Peerless, Repka Malenka, Anisim, Nelson.

CRABS AND HYBRIDS.

Best for general cultivation: Virginia, Whitney, Minnesota, Sweet Russet.
Promising varieties for trial: Dartt, Pride of Minneapolis.

PLUMS.

Best for general cultivation: De Soto, Cheney, Wolf, Rollingstone, Wyant.
Most promising varieties for trial: Rockford, Ocheeda, Surprise, Aitken.

GRAPES.

Concord, Delaware, Moore's Early, Worden, Brighton.

RASPBERRIES.

Red varieties: Turner, Cuthbert, Louden, Miller.
Black and purple varieties: Ohio, Palmer, Nemaha, Older, Columbia.

BLACKBERRIES.

Ancient Briton, Snyder.

CURRANTS.

Red Dutch, White Grape, Victoria, Long Bunch Holland.

GOOSEBERRIES.

Houghton, Downing, Red Jacket.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Wilson, Enchance, Lovett, Splendid.

NATIVE FRUITS OF SOME VALUE.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

PREMIUMS ON APPLES.

Plate Wealthy—First, J. B. Mitchell; second, J. C. Hawkins.
Plate Hibernal—First, J. B. Mitchell.
Plate Peerless—First, A. Hamlin.

Plate Malinda—First, L. W. Allen; second, L. W. Allen.
Plate Longfield—First. J. C. Hawkins.
Plate Patten—First, C. G. Patten; second, A. Hamlin.
Plate New Seedling Apple—First, C. Morgan.
Collection of Apples—First, C. Morgan; second, J. B. Mitchell.
Collection of New Seedling Apples—First, C. Morgan.

PREMIUMS ON ESSAYS.

First Premium—Irene E. Warren, Spring Valley.
Second Premium—Robert Wedge, Albert Lea.

OFFICERS ELECTED.

President—J. C. Hawkins, Austin.
Vice President for Mower County—O. L. Gregg, Austin.
Vice President for Freeborn County—J. Freeman, Austin.
Vice President for Fillmore County—O. W. Moore, Spring Valley.
Secretary and Treasurer—R. Parkhill, Chatfield.

The meeting adjourned to meet at Albert Lea at call of executive committee.

MEADOW VALE HORTICULTURAL CLUB, SECRETARY'S REPORT, 1898.

A. W. KEAYS, SEC'Y, ELK RIVER.

My report for the past year as secretary of this society can be given in a few lines. In the first place we have a membership of forty-nine. Our treasury is amply supplied with funds to meet all expenses, leaving a good surplus for the coming year, which is due to the good management of our executive board. Our members have nearly all been engaged in some branch of horticultural work. One of them picked over nine bushels of strawberries from a small bed, another one got $85 worth from a larger bed. A large number of fruit trees and plants have been set the past spring; those have made a splendid growth. It has been demonstrated without doubt that fruit trees and plants must have thorough cultivation and that grass and weeds are mortal enemies to fruit trees and plants. I cultivate my orchard until the frost kills the weeds, but I cultivate very shallow.

As manager of the experiment stock I must say that the behavior of the different varieties has been a very interesting study to me. I have kept a record of the inches of growth, hardiness, blight, effects of wet and drought, first bloom, first fruit of about 650 trees. We have forty-three varieties of cultivated plums, thirteen varieties of cherries, three of pears and peaches and 108 varieties of apples, besides a large lot of small fruit plants. Yellow Sweet is proving to be a hardy tree, Longfield and Wealthy are fine growers. I think

Charlamoff will prove to be a better tree to grow in this latitude than Duchess. Some of the newer kinds appear to be extra hardy. I have some new seedlings that are very fine growers. The Compass cherry fruited well, did not rot, hung to the tree until they commenced to dry up. First fruit ripe August 15, last fruit October 2, covering forty-seven days. I expect by double working to extend the season some days longer.

The following apple trees were sent for trial to this society by Clarence Wedge, of Albert Lea, in 1897: Greenwood, Brett No. 2, Gipsy Girl, Revel Pear, Dartt, Grandmother, No. 8 Oligee, No. 10 Oligee, Avista, No. 14 Oligee, Kaump and four unknown trees. Of those No. 14 Oligee, No. 8 Oligee, Gipsy Girl, Avista and the four unknown have done extra well. In the spring of 1898, John P. Andrews sent two D. H. seedlings, four Arabian and one Cottril plum.

We received from Prof. Green twenty-five Douglas spruce, two buffalo berry, two spirea Van Houteii, two hydrangeas, two Wisconsin weeping willows, twenty-five pear cions and twenty-five Norway spruce—all are growing nicely. I think the Douglas spruce will prove a valuable tree for this section. I have worked the pear cions on June berries, and they have grown nicely. A large number of apple trees have fruit buds, which I expect to bear the coming summer. I expect the coming winter will be a hard one, as the trees have ripened up their wood sooner than usual. If this proves to be correct, we will have a fine chance to see the behavior of the different varieties.

Now, in conclusion, I think the time is near when every person having a farm or lot in this section will grow all the apples, plums, cherries, grapes, raspberries, strawberries they may need for home use. Just think, one and one-half barrels of large apples from a tree set six years. What others have done, you can do. Then our homes will be more home like and our children will long to return to the old home where an abundance of fruit may be had for the pickling. And we may enjoy these blessings ourselves, and other heathens yet in darkness may be encouraged to do likewise, and instead of growing apples being a curiosity as at present, they will be found to be a necessary adjunct to our existence—when we can truly say we have found the missing link.

At the annual meeting held October 29, 1898, of the Meadow Vale Horticultural Club, officers were elected as follows:

President—Chas. A. Hill.
Vice President—Fred. Keasling.
Secretary—A. W. Keays.
Treasurer—Jonathan Heath.
Executive Board—Mrs. Anna Mills, Geo. Keasling and Hiram Bailey.

The meeting consisted of secretary's report, a lecture by V. O. Bailey, Chief Field Naturalist of the Biological Survey, Washington, on the distribution of species, plants and animals, showing the life zones of plants and animals, particularly fruit trees and their northern limit of endurance. We believe this fruit zone is

slowly moving north. As fruits become acclimated their seedlings will be hardier. This has been proven in our experiments here. The meeting was enlivened by guitar solos, songs, recitations, readings on various horticultural topics, being the best meeting the society has held. Next annual meeting last Saturday in October. No people anywhere enjoy themselves more than do the horticulturists.

THE PLANTING AND CULTIVATION OF THE CURRANT FOR THE AMATEUR.

A. D. LEACH, EXCELSIOR.

In the first place, let me call your attention to a few things which should not be done:

Do not set your currant bushes in the fence corners or along the garden fence to save cultivation.

Do not let the grass and weeds get above your bushes or form a sod among them. I tried this way of growing currants once and did not succeed.

If you discover the currant worm on your bushes, don't wait until next week or next month, but spray them immediately.

Do not set your bushes on poor land without a liberal application of manure. The currant is a rank feeder, and in order to have good currants the land must be rich and kept clean.

Although the currant is one of the easiest of fruits to start, yet it is necessary to know something of its habits in order to succeed.

The best method of starting currants is from cuttings of the past summer's growth, and I think the best time to cut and set them is the last of September or first of October, though they may be set any time before the ground freezes or in the early spring.

The ground should be ploughed quite deep, say eight or ten inches, and made mellow by dragging. Then stretch a line where your first row is wanted. Cut your cuttings from six to eight inches long, and if the soil is mellow they may be pushed into it until only one bud is left above the ground and the soil pressed firmly about them with the hand or foot—if the ground is hard, use the dibble. I usually put them in the ground on a slant, as it is easier to make the soil firm around them. The plants should be set about six inches apart, and the rows far enough apart to admit of cultivation with a horse. If they are planted in September, they will be thoroughly calloused before winter sets in, and if the soil is moist the roots will start. At all events, they will be ready for a vigorous growth in the early spring and will be nice bushes for transplanting in the fall. Then trim to one shoot and transplant in October on land made rich by a heavy application of barnyard manure. Lay the land off with rows running north and south, if convenient, and six feet apart, and put the bushes five feet apart in the row Cultivate them thoroughly, and you will have fine bushes in the fall.

Trim the bushes into shape each autumn and commence taking

out the old growth after the fourth year, not suffering any wood to grow except what is needed for fruit or to enlarge the bush. After the third year a good forkful of barnyard manure should be put at the roots of each bush every fall.

After the first or second year cultivate shallow and not close up to the bushes. Use the hoe around the bushes.

If you plant the suckering kinds, like the Victoria, the suckers should be pulled out about the time the currants are half set each spring. Do not neglect this, if best results are expected.

I have had good success with green clover mulching in currants—it saves cultivation, keeps the soil cool, moist and mellow, and the fruit clean. Try it.

I will close by saying—plant only the best varieties, give them the best of care, and your reward will be a fine crop of the best of fruit.

BROWN COUNTY HORTICULTURAL CLUB.

ARMAND PETRY, SECRETARY, NEW ULM.

It is with great pleasure on my part that I can report to you today the permanent organization of the "Brown County Horticultural Club," which was effected at a meeting of a few friends of the aims of your society, held yesterday afternoon at the office of Mr. Wm. Pfaender, Jr. The informal meeting was presided over by Mr. Otto Schell, assisted by Mr. Wm. Pfaendar as secretary. A constitution with by-laws was adopted after the form indicated in the Report of the State Horticultural Society for 1894, eight members signing it. The permanent organization elected Mr. John Zeller as president, and the undersigned as secretary and treasurer. A special meeting of the club will be held in the near future, when President Zeller will endeavor to have appear before it some of the able speakers of your society. We expect to have a good meeting, which will lead to swelling the number of our members to over twenty-five before the first of the year, when we shall join your society in a body.

Dec. 12, 1898.

JANUARY MEETING, BY E. H. S. DARTT.

It was my privilege to attend a meeting of the Brown County Horticultural Club at New Ulm, Jan. 10th. There was a fair attendance. Members seemed earnest and energetic. Mr. John Zellar, the president of the club, delights in being called a tree crank. He has planted a young orchard of 200 or 300 trees, and cultivates small fruits and vegetables between the rows. Orchard location, soil and best varieties were discussed. They have faith in many varieties that are quite likely to fail when our next very severe winter comes.

Martin Penning, of Sleepy Eye, gave a list of best plums as follows: Surprise, Stoddard, Wyant, De Soto and Cheney. The Surprise is a new variety originated by Mr. Penning, and two trees have been ordered for the Owatonna Tree Station. Mr. Penning thinks the New Ulm is too soft for shipment.

JANUARY MEETING, BY ARMAND PETRY, SECRETARY, NEW ULM.

The Brown County Horticultural Club held its first public meeting Tuesday afternoon, Jan. 10, 1899, at the court-room of the old court-house, New Ulm. The meeting was opened by President John Zeller, who, in a short speech, introduced Mr. E. H. S. Dartt, of Owatonna.

Mr. Dartt opened the program with a paper on "Girdling," which was well received and discussed. Other papers were read by Mr. Martin Penning, of Sleepy Eye, (two papers, one on "Best Varieties of Plums for the Northwest," one on "The Best Method of Propagating Plums"), and Mr. John Zeller, on "Location, Soil and Windbreaks." Mr. Dartt talked on top-working, Mr. John Manderfield, Sr., on cultivating and mulching the orchard and Mr. Zeller on planting and cultivating the plum orchard.

Resolutions were unanimously adopted in opposition to the passage by the state legislature of a law "to prevent the introduction and spread of the San José Scale."

ANNUAL MEETING, 1899, IOWA STATE HORTICULTURAL SOCIETY.

E. H. S. DARTT, DELEGATE, OWATONNA.

It afforded me great pleasure to meet again with the veterans of Iowa. Since my visit of long ago many have left "for parts unknown," and I am strongly impressed with the insignificance of a man's life. The attendance was not quite equal to our average attendance in Minnesota, but, perhaps, made up in character for its deficiency in numbers. It is the part of wisdom to enlist a force equal to the obstacles to be overcome. We need a larger army to beat our Minnesota climate than they need to beat theirs in Iowa.

The delegates present from other states were N. F. Murray, Oregon, Mo.; W. H. Barnes, Topeka, Kas.; and Geo. J. Foster, of Normal, Ill. Professors Craig and Summers, the new horticulturist and entomologist at the State Experiment Station, at Ames, were present and gave enteresting talks on fungous diseases and injurious insects, and told us when, what and how to spray to avoid injury from these causes.

Over the north one-third of the state the fruit crop was quite large, but south of that only about one-fourth of a crop of apples was gathered. The failure is supposed to have resulted from imperfect pollenization, caused by wet weather at blossoming time.

Russian pears continue to blight, and Russian plums and cherries have generally proven a failure in northern sections, while in the southern half of the state fine crops of peaches, plums, prunes and cherries were harvested. Russian apples are highly prized by some of the northern growers, but not so by those in central sections. Mr. Watrous thinks no advantages have been gained by the introduction of Russian apples, cherries, pears and plums; some others speak favorably of these fruits in southern sections.

There were eighteen experiment stations. A resolution was adopted discontinuing all stations. Later eight new ones were

established under specific rules. Two are to pay especial attention to cross fertilization of apples, two are to look after plums and cherries, and two after small fruits. Two will grow as many seedling apples as possible to be used as stocks on which to graft tender varieties.

The society has offered a premium of $50 for the best Hand Book of Horticulture suitable for use in the public schools. The committee having the matter in charge reported that they found it difficult to secure a book sufficiently comprehensive within the limits prescribed by the former resolution. The committee was continued with increased powers.

In speaking of cold storage, Mr. Haviland, of Fort Dodge, stated that the Duchess did not keep well where ice was used. Chemicals should be used and temperature should be maintained at about 32°. In that way it could be kept for any length of time; but with ice storage it could not be safely held beyond November 1st.

He mentioned the Wealthy as a good cold storage apple. He would pick as soon as they begin to fall. They do not color up after they are put in storage, but with the Wealthy the green apples become yellow—and flavor seems improved. Mr. H. packs in barrels, and was then selling cold storage Wealthys at $4.50 per barrel, which is 50 cents more than any other variety will bring.

The great need of Iowa is a first class winter apple adapted to the north part of the state, and none can doubt that the efforts now being put forth in that direction will soon be crowned with success.

IMPORTANT WEATHER FACTS IN 1898.

(From December Report of Wm. Cheney, Weather Observer, Minneapolis.)

December was very cold, the mean temperature of the month being nearly six degrees lower than the average December for 34 years. It was nearly five degrees colder than December of last year, and in the last 22 years we have had only four as cold Decembers. The month came in cold and continued cold through the first half of the month, the mercury not rising to freezing point during the first 16 days, and on eight of these days the thermometer marked a minimum below zero. The week following Dec. 16 was milder, the maximum going to freezing point and above on three days, and the minimum not going below zero until Dec. 24. The last two days of the month were excessively cold, the mean temperature of each being 17 degrees below zero. These were the coldest days on record in December since 1886. Dec. 26, 1886, was one degree colder. Total snowfall, in inches, 0.70; greatest precipitation in any 24 consecutive hours, (24th), 0.03; number of days on which .01 or more precipitation fell, 4; clear days, 15; partly cloudy, 11; cloudy, 5. The prevailing winds were from the northeast.

Average mean temperature of December for 35 years, 16.01.

RESULTS FOR THE YEAR 1898.

Mean temperature of the year	44.09
Maximum temperature of the year (Aug. 22)	95.00
Minimum temperature of the year (Dec. 31)	*25.00
Range of the year	120.00
Total water deposit for the year, in inches	27.54
Total snowfall for the year, in inches	38.50
Average mean temperature of year for 34 years	42.54
Average annual water deposit for 34 years, inches	28.439

RESULTS FOR DECEMBER, 1898.

Mean temperature of the month	10.30
Maximum temperature of the month (17th)	37 00
Minimum temperature of the month (31st)	25 00
Range of the month	62.00
Highest daily mean (20th)	29.60
Lowest daily mean (30th and 31st)	*17.00
Greatest daily range (26th)	37.00
Least daily range (9th and 19th)	9.00
Mean humidity of the month	.57
Mean height of barometer, corrected for temperature and elevation	30.11
Total water deposit, in inches	.07
Hottest year in 34 years was 1878	46.51
Coldest year in 34 years was 1883	38.90
Absolute range in yearly temperature in 34 years	7.61
Rain fell on 88 days and snow on 47.	
Number of clear days in 1898	128
Partly cloudy days	133
Cloudy days	104
Maximum thermometer in 34 years (July 26, 1894)	105.00
Minimum thermometer in 34 years (Jan. 21, 1888)	*-42.00

In the last ten years the minimum thermometer has not once been below 30 degrees below zero, while in the 25 years preceding in only eight of them was the minimum thermometer higher than 30 degrees below zero. In 14 of these 25 years, from 1864 to 1888 inclusive, the minimum was 30 or more below zero, and in three of these years it was 40 or more below.

Our winters seem to be growing warmer. Thirteen of the last 22 years have been above the average annual mean temperature of 34 years, but the annual mean temperature for the last 34 years is only 0.27 higher than the annual mean in 1875 for 11 years.

QUALITY TEST FOR POTATOES.—We must learn to grade potatoes according to quality. There is just as much difference between a mealy and soggy potato as there is between tenderloin and rump steak. The difficulty is to sort out the good ones. Here is the potato test: Wash them and put them in a tub of water. They will all sink. Add salt, and the poorer, lighter ones will rise. Add more salt, and others will rise. Those which finally remain at the bottom you can warrant every time to be prime bakers. Not over 10 to 20 per cent of potatoes will stand the test. For these your customers will gladly pay an extra price.—[H. B. C.

THE PLANT WINDOW IN WINTER.

MRS. O. C. GREGG, LYND.

When September frosts remind us that summer is bidding us good-bye and winter is approaching with quick steps to greet us, we feel as we do when saying good-bye to a bright and cheery friend and turning to meet the courtesies of an unwelcome guest or actual enemy. Still, years have taught us that winters are not wholly forbidding, and when friends depart and the unwelcome arrives we courageously look the facts in the face and smile in hope of future possibilities. Just so, when the wealth of summer's bloom is passing we gather to our firesides as much of the bright and gay as we can to modify the bleakness of the winter days and make us glad in spite of cheerless surroundings.

"For never sit we down and say
There's nothing left but sorrow,
We tread the wilderness today
The Promised Land tomorrow."

The plant window in any home is a sign of cheerfulness to those who have prepared it. The plant window is the hope window which looks toward Heaven. It gives a furnishing which can be brought to the house in no other way. Fresh indeed is the green of its leaves and pure indeed the white of its flowers, bright are its roses and glorious its lilies, while a very shout of victory comes from its orchids and palms. One might almost say it is the lingering smile of a departing summer, looking forward to a sure resurrection the coming spring.

But preparation must ever precede enjoyment. Much planning and work must go before the happy consummation of a plant window in winter is in full bloom. First, we must plan our window, and then adjust our plants to it, or, perhaps, adjust our plants to the window we now have. All this means a good deal, for our plants must be potted early enough to have them presentable before bringing them to the window. After this comes the daily care of watering, watching for insects, with patient waiting through the cold, dreary months of November and December for blossoms,—unless chrysanthemums and other fall-flowering plants are a part of our collection.

A winter collection should, however, contain many varieties, so that a continuous bloom may be enjoyed. In summer we are content with a few decorative plants in the house, but for winter's cheer we want all we can make room for. Geraniums are always good stand-bys and for the inexperienced grower, perhaps, the least disappointing. To these may be added ivies and other vines, with callas, begonias, the agapanthus, the cyperus and a liberal supply of bulbs, for the window is never in its glory until freesias, hyacinths, narcissus, daffodils, jonquils and other bulbs are provided—and that lavishly, for each bloom is a joy and affords more delight than many more costly pleasures.

To succeed in having early winter bloom we must pot plants early in the fall and, also, order bulbs early—starting freesias first, early in September. Crocusses, if we have them, should be started in August, but hyacinths, narcissus and daffodils should be potted in October for early winter blooming. Verbenas or petunias, also, give effective flowers, and heliotropes are both sweet and beautiful. To these may be added lilies, cacti and palms, if one has room for them.

With such provision for our window, it is a delightful pleasure in winter to make frequent visits to our flowers when everything without is cold and cheerless, and if the sun shines it only serves to heighten their beauty; so, in either case they give us joy.

It is always a place where our friends love to linger, and they afford a subject for a large amount of innocent conversation. "How do your plants prosper?" is a frequent question asked of one plant lover by another, and mothers seemingly take as much interest in their flowers as in their children—possibly, because their children are interested in them themselves, and they notice the happy effect flowers have upon their young, developing natures. Children learn to love plants by being brought up with them, and in after years they will make their own homes glorious with them.

Then how many festive and funeral occasions have been blessed with their blooms; how many sick-beds cheered and letters weighted with them have reached many a relative or friend to speak in a way which words cannot express the thoughts and feelings of the absent.

Then, beautiful indeed is our winter garden, and worthy is it to make it beautiful, for it brings to us more than it costs. It is a happy reminder of the power of cheerfulness in the midst of gloom that hopeful attitude toward life, hopeful even of the return of what we have lost. A beautiful little poem of Mrs Ella Higginson gives the same thought:

WHEN THE BIRDS GO NORTH AGAIN.

Oh, every year hath its winter,
And every year hath its rain,
But a day is always coming,
When the birds go north again;

When new leaves swell in the forest,
And grass springs green on the plain,
And the alder's veins turn crimson,
And the birds go north again.

Oh, every heart hath its sorrow,
And every heart hath its pain,
But a day is always coming,
When the birds go north again.

'Tis the sweetest thing to remember,
If courage be on the wane;
When the cold, dark days are over,
Why the birds go north again.

MY SELECTION OF VARIETIES IN AN ORCHARD OF 100 TREES.

WYMAN ELLIOT, MINNEAPOLIS.

In the selection of varieties of apples for a commercial orchard for this climate there are several distinctive qualities to be considered, viz.: hardiness, longevity, productiveness, size, shape, color, flavor and season. All these should receive minute consideration.

It is an old and true saying that "handsome is that handsome does." The profitableness of a variety depends very much upon its productiveness and commanding a good price when marketed. To be a first-class apple for wholesaling and retailing from fruit stands it is essential that it be uniform in shape, of good size, showy and attractive in color, of inviting flavor for cooking and eating out of the hand, and as it possesses these qualifications its value for profit is determined.

In the long list of varieties of apples which we are now cultivating, there is not one in its season more tempting to the eye and taste or which commands a better price than the Wealthy. We have several kinds that are valuable for special purposes, but none of them bear the reputation with the connoisseur of fine fruits that the Wealthy has acquired. It is fast gaining the esteem among the list of apples of real merit that the Hubbard squash with vegetables has obtained for market and culinary purposes. Its popularity will be recognized in all lands as it becomes known; and with the modern methods now used for extending its season it can be kept in good condition until March or April at the moderate expense of forty-five cents per barrel in cold storage. When its value as a first-class dessert and cooking apple is considered, where can we find one that surpasses it or fills its place as well?

Then, as a tree in the nursery and orchard, there are few its equal in vigor and growth, and with the method of top-working on hardy trees as now recommended for its propagation there is no variety superior to plant or one that gives earlier or more continuous remunerative returns for the labor expended. Its over-productiveness is one of the causes affecting its hardiness and longevity, but this can be easily prevented by judicious thinning of the fruit when it is less than one-quarter grown, each year that the tree is inclined to overbear.

Now, to come to the subject assigned me of my selection of varieties in an orchard of 1,000 trees. This would depend largely on location, soil, expense and for what purpose designed, whether for experiment or trial, or to be confined strictly to raising of fruit commercially for profit. After givihg this subject considerable solicitous investigation by correspondence and comparing the practical efforts of those having the largest experience in this and surrounding states, together with my own observations, I would choose the following varieties for profit with these methods of propagation: 500 Wealthy, top-worked on Hibernal or Silken Leaf when these trees were three years old. Graft the scions of the Wealthy on the central leader and side limbs, preferring to have the body of the tree at least three feet high. 250 Wealthy grafts double-worked,

using short-piece apple roots, then a short graft of some very hardy variety, a crab or Russian preferred, and on top of this a long scion of the Wealthy, the grafts to be planted, leaving only the top bud out of the ground, that the first and second scion may take roots; these trees to be transplanted into the orchard when two years old. 50 Borovinka, 35 Charlamoff, 15 Duchess, (all of these can be marketed as Duchess),50 Patten's Greening (top-worked), 25 Hibernal, 25 Peter, 25 Anisim, 25 Longfield.

This makes out the full complement of the commercial orchard. In addition to this I should want an experiment orchard of 300 trees, at least, as follows:

RUSSIANS.

Five Anismoka, 5 Antonovka, 5 Beautiful Arcade, 5 Blushed Calville, 5 No. 385 Bode, or Bade's, 5 Breskovka, 5 Cross, 5 Christmas, 5 Glass Green, 5 Lowland Raspberry, 5 Lubsk Queen, 5 4M Ostrekoff, 15 Repka Melenda, 10 Royal Table, 5 Russian Gravenstein, 5 Red Queen, 5 Sandy Glass, 5 Silken Leaf, 5 White Pigeon, 5 Yellow Sweet, 5 Yellow Transparent.

SEEDLINGS AND AMERICAN VARIETIES.

5 Brett No.1, 5 Fameuse, 5 Giant Swaar, 5 Gilbert, 5 Grimes' Golden, 5 Haas, 5 Lou, 5 McMahon, 5 Okabena, 5 Peerless, 5 Rollins' Proliffc, 10 Shockley, 5 Talman Sweet, 5 Utter, 5 Wolf River, 5 Wolf Seedlings, 5 No. 2 Lightly Seedling, 5 Oxford Orange, 5 Holtz, 5 Lord's L. Seedling.

CRAB APPLES.

5 Dartt Seedling, 5 Florence, 5 Gideon No. 6, 5 Hyslop, 5 Martha, 5 Strawberry, 5 Sweet Russet, 5 Tonka, 5 Virginia, 5 Whitney, 5 Transcendent.

With this fine list of apples, when in full bearing, I should expect to take some of the prizes offered at the state fair, now taken by Brothers Harris, Somerville and others.

From eleven correspondents naming thirty-five varieties of apples, the Wealthy is recommended by 10, Duchess by 8, Hibernal by 7, Patten's Greening by 6, Anisim by 4, Charlamoff, Borovinka, Okabena, each by 3; Malinda, Longfield, Peerless each by 2; Lou, Peter, Blushed Calvelle, Lieby, Romna, Bode, White Pigeon, Christmas, Red Queen, Anismoka, Cross, Russian Gravenstein, Royal Table Wolf, Gideon No. 6, Breskovka, Silken Leaf, McMahon, Gilbert, Itasca Euella, each by 1—to be used as orchard trees or for stock on which to top-work other varieties. I append extracts from these correspondents that you may get their ideas as originally given and that you may not be mislead by my opinions.

VARIETIES.

P. M. Gideon. "The Wealthy leads the Duchess for profit. For a commercial orchard in Minnesota, take Lou for early and Wealthy and Peter for late, and you can sell in any market, no matter what the glut is of other apples, and for crabs Martha, Florence and No. 9. No others are ever in their way. No. 9 leads all; it's the world beater of all small apples."

Andrew Peterson's list for planting.—

"First, *Summer Apples.* No. 262, Charlamoff; trees blight some when young, but not when they get old. I call them just as hardy

as the Duchess, and in quality they are the best of all the named apples we have in Minnesota. No. 138 Borovinka; fruit ripens a little later than Duchess, but the trees are more hardy and don't blight. No. 22 Blushed Calville; they blight more, but a very heavy bearer of good quality.

"*Fall Apples.* No. 378 Hibernal, 240 Leiby, are just the same, can't see any difference, and No. 599 Romna is just the same in quality and hardiness, but the trees grow in better shape. No. 385 Bode is the hardiest tree of all the Russians, a good bearer, but the fruit is a little sour to eat from the hand. No. 317 White Pigeon is a hardy tree, and the fruit is good.

"*Winter varieties.* 310 Christmas; tree don't blight and keeps until Christmas; of a nice red color, of middling size. 316 Red Queen; a large, showy fruit, good in quality, keeps until July. 18 Anismoka; a nice red apple, sells best of all in the market; keeps until March. 413 Cross; a large apple of good quality and keeps until Christmas. 105 Russian Gravenstein; of good quality; tree is hardy. No. 5 Royal Table; the longest keeper of all the Russians. Wolf's Seedling; in tree, leaves and shape, it is like Rawles Janet, but in color and quality it is like the Fameuse, and the fruit keeps until May. They are the best of my winter apples. Patten's Greening; I like them very much; blight a little when young, but not now; of nice shape with broad top, so it protects itself from sun scald; fruit keeps until the last part of January."

C. G. Patten. "I would plant the orchard as follows: 400 Greening, 400 Wealthy, 200 Good Peasant."

Wm. Somerville thinks Wealthy top-worked on Hibernal or Transcendent crab would be a success.

E. H. S. Dartt. "If I were to set an orchard of 1,000 trees, I would like to experiment with the following: 200 Wealthy, 200 Anisim, 200 Hibernal, 100 Duchess, 100 Patten's Greening, 50 Borovinka, 50 Okabena, 50 Dartt crab, 50 Gideon No. 6."

J. P. Andrews. "My old orchard was planted twenty years ago next spring. The standards were Duchess and Wealthy, and the Duchess have paid much better than the Wealthy, and the Wealthy have played out much faster than Duchess. Notwithstanding this, we planted last fall twice as many Wealthy as Duchess."

John S. Harris. "For a commercial orchard of 1,000 trees I should plant 200 root-grafts of Wealthy and 200 stocks of some kind to be top-worked to Wealthy (at present Hibernal preferred), 50 Patten, 50 Anisim, 100 Borovinka or Duchess, 50 Longfield, top-grafted, and 50 root-grafts, 50 Okabena, 100 Virginia and other crabs to be worked on if not wanted for their fruit, and 50 trees of some very early variety, Yellow Transparent would be my choice, if it did not blight badly. Breskovka is better if it is early enough. The extra hundred crabs can be saved for some nice thing that survives the next test winter."

W. E. Haverland, Fort Dodge, Ia. I place so much value upon the answer to the questions put, I will quote entire letter. "We have twenty-five acres of Wealthy, fifteen acres of mixed varieties. First, Duchess is not a No. 1 apple for cold storage, but with special care season can be extended. Second, the Wealthy stores well. Third,

time to gather the Duchess is just as the seed begins to color. Fourth, time to gather Wealthy, as soon as it drops easily from the stem and gets good color. Fifth, I cannot recommend Patten's Greening, as its season is not any longer than Wealthy, and I consider the Wealthy the best apple to grow for commerce. Seventh, if I was going to plant 1,000 trees at Minnetonka, I would set the Silken Leaf and top-work them with Wealthy."

R. C. Keel. "I will give you the names of the 1,000 apple trees I would set out. 150 Duchess, 350 Wealthy, 200 Longfield, 200 Hibernal, 25 McMahon, 25 Anisim. These six varieties are certainly some of the best that I know anything about, and one setting them will not miss it. Out of this lot I think the Wealthy the best money maker; it bears quite young and heavily, and will always bring the top market price. The Longfield would pay for themselves the quickest, but would be the first to give out. I would set this variety on one side of the orchard so I could replant without spoiling the looks of my orchard. It lasts about ten years. Some of the new varieties, such as Peerless, Okabena, Gilbert, etc., may be good, but no one has ever made any money out of them as yet, and unless I could get trees at the same price as common trees would not plant them, for there is none of them that will give the returns that the Wealthy will."

Clarence Wedge. "If setting an orchard of 1,000 trees where I had opportunity and desire to cater to a nice home market, especially if near a northern city, I would set varieties about as follows: 160 Martha crab, 40 Sweet Russet, 200 Duchess or Charlamoff for early, 200 Patten's Greening, 400 Hibernal or Virginia to top-work. the former preferred, as it is less liable to patch or body blight."

Prof. S. B. Green. "In relation to planting orchards for commercial purposes in Carver county, Hibernal 350, Wealthy 350, Duchess 150, Charlamoff, 150. I would prefer to have Wealthy top-worked on Virginia, the others root-grafted with long scions and planted rather deep when they are set out. My idea in putting in the Charlamoff is that it prolongs the selling season of the Duchess. Charlamoff will generally sell for Duchess and comes in later. I think that while the Hibernal is of poor quality for eating, if hard it is such an admirable cooking apple that it is destined to be popular when it is well known, and the tree is so hardy that any one can grow it."

J. M. Underwood. "Not to put the eggs all into one basket, in planting 1,000 trees I would suggest 200 Wealthy trees from root-graft, 200 crabs to be top-worked, 300 Hibernal to be top-worked also. Then I would graft 50 of the crabs to Wealthy and 50 to Malinda, the Hibernal top-worked to Wealthy also. I have quite an admiration for the Anisim and Patten, but do not know them well enough yet to recommend them in large quantities."

Through the courtesy of a friend I am permitted to make extracts from a letter of inquiry of what to plant in a commercial orchard from:

O. F. Brand. "Replying to yours of 8th inst., will say that for an orchard of 1,000 trees I would plant, where you are (Carver county), 50 Duchess, 50 Itasca, 50 Malinda, 700 Peerless, 150 Euella. But as you cannot get the Euella now, I would make it 850 Peerless. I don't see how you could better that."

CAPILLARY WATER OF THE SOIL.

H. H. HARRINGTON, COLLEGE STATION, TEXAS.

If we take a small glass rod and dip it into a goblet of water it will be observed that the water rises a little way along the surface of the rod. Or if we use a small glass tube instead of a rod, the water will rise a greater distance, or if we take a rock and place it in a pan of water, say, half immersed, the water will rise in a thin film along the surface of the rock. This movement of water illustrates what we call capillary attraction. The vertical distance to which this water can rise in these tubes is inversely proportional to the size of the tube. That is to say, the smaller the tube, the higher the water will go; while on a surface, as illustrated in the case of the rock, the vertical rise of the water will be very small. In a soil, therefore, we do not want rocks of clods because the capillary water which feeds the plant can not rise to the plant roots and replace the moisture carried off by evaporation. But if the soil is pulverized and of an even mechanical condition, with a certain degree of compactness, then the capillarity takes place more readily and moisture passes to the surface. In cultivation, then, our first object is to pulverize the soil and carry this mechanical condition as deep beneath the surface as our time and means will allow. By this we create a large amount of surface within the soil to hold winter and early spring moisture. According to King, a cubic foot of marbles one inch in diameter possesses an aggregate surface of twenty-seven and seven-tenths square feet, but if the marbles were pulverized until their diameter was only one-thousandth part of an inch, then the total area per cubic foot would be increased to twenty-seven thousand and seven hundred square feet. The great difference of water-holding power between the two can be readily appreciated, and with it the necessity of having the soil in proper mechanical condition. But, as we have said, there must be a certain degree of compactness to the soil in order that the water may reach from below to the surface by capillary movement. If the soil is too loose or open, the water can not be drawn through it by capillary attraction. Therefore, in times of drouth, and especially after a shower of rain, shallow plowing should be done in order to retain a soft mulch of dust or dry earth over the pores or capillary channels of the moist soil beneath, breaking the avenue of escape of soil moisture to the surface. On the other hand, this shallow cultivation should be frequent enough to keep the surface thoroughly open and so loose that water cannot rise through it, thus forcing it to go through the tissues of the plant. On the other hand, the time and labor, as well as the stage of growth of the plant, must have a controlling influence on the frequency of cultivation. In a heavy clay soil, fall or winter plowing may be a disadvantage, or at least a waste of time, because of tamping or puddling the soil, causing it to run together.—*Texas Farm and Ranch.*

Secretary's Corner.

A CORRECTION IN THE REPORT OF NOMENCLATURE COMMISSION.—A correction to this report came in from Prof. Hansen, but the form had already been printed. On page 45, in the description of "Golden White," read "Avenarius," instead of "Tuenarius."

THE NEW IOWA SECRETARY.—Notice has just reached this office of the resignation of Sec. Geo. H. Van Houten, of the Iowa Society, and the appointment of Mr. Wesling Greene, of Davenport, as his successor, to take effect March 13th.

DO YOU WANT ANY READING MATTER?—The secretary has an accumulation of surplus papers and books on horticultural and agricultural subjects which will be packed and sent free (the receiver to pay express) to applicants as long as the supply lasts.

PRESIDENT PENDERGAST AT HOME IN HUTCHINSON.—The office Prof. Pendergast has so long occupied in the capitol at St. Paul, as State Superintendent of Public Instruction, is now turned over to his successor, and he will be found hereafter at his home in Hutchinson cultivating the gentle arts of Ceres and Pomona.

A MINNESOTAN MANAGER OF THE NEW YORK BOTANICAL GARDEN.—D. T. McDougal, professor of botany at the State University for a number of years, has recently been elected to fill this important position. The gardens comprise 250 acres in Bronx Park and centrally located in New York City. The professor is a practical worker of high attainments and will be sorely missed here.

WYMAN ELLIOT A MEMBER OF THE MINNEAPOLIS PARK BOARD.—The recent election of Mr. Wyman Elliot to fill a vacancy on this board is a deserved tribute to his practical attainments and interest in the work of the board. While a member of the city council he represented that body on the board, and now his term in the council having expired his services are still fortunately to be retained.

SUPERINTENDENT OF HORTICULTURAL DEPARTMENT AT STATE FAIR IN 1889.—J. M. Underwood has been appointed head of this department for this year. Following the usual practice, Mr. Wyman Elliot having retired from the Board, and Mr. Underwood being still a member and a practical horticulturist, was chosen to succeed him. We shall all try, as usual, to make "this exhibit" the "best one," and "progress" being our motto, we expect to succeed. Will *you* help?

ANNUAL MEETING, WISCONSIN STATE HORTICULTURAL SOCIETY.—This meeting will open Monday evening, February 6, at Madison, and continue in session four days. Tuesday evening is given up to forestry entirely. Thursday evening the Alumni of Agricultural College will hold the boards. We are glad the young people are to have a chance to be heard. As before stated, Mr. Underwood will go from Minnesota to represent our society, and we hope others, as well, who can make it convenient.

A LONG SCION AND A SHORT ROOT.—The secretary in his corner last month was guilty of a serious reversion. It is so easy to twist things in this way, but an editor should *never* do it. Don't make the mistake of planting root-grafts with a "short scion and a long root," even if the Secretary's Corner does counsel it. A long scion gives an opportunity for roots to grow from it and will result in a much hardier and safer tree than "a short scion and a long root." Make your root-grafts with a "long scion and a short root." In either case avoid "budded trees"—you don't *want them at all.*

GREEN'S "FORESTRY IN MINNESOTA," IN CLOTH AS A PREMIUM.—The Horticultural Society has had a quantity of this new work, by Prof. S. B. Green, bound in cloth in a neat and substantial way to match the other books on fruit and vegetable culture by the same author. This valuable work, of 311 pages, is offered by the society to our members as a premium for securing new members. It is an easy way for you to secure in form for permanent preservation a copy of a work you can make of great practical use. It can be bought of the secretary also for 50c., postpaid.

DEATH OF H. D. BURCH, EXCELSIOR.—The sudden death of Mr. Burch, which occurred early in the year, removes from our midst a practical horticulturist of many years experience in our state. A personal acquaintance with Mr. Burch has given the writer a high opinion of his worth as a Christian citizen and zealous worker in every good cause. Though not long allied with our society, his value to local horticulture was fully recognized. By education a lawyer, and devoting a large share of his life to the profession of teaching, he brought to the practice of our art a high degree of intelligence.

THE PROPOSED LEGISLATION "REGULATING INTRODUCTION AND SALE OF NURSERY STOCK."—The committee appointed at the late annual meeting of this society to prepare a bill for the purpose expressed in the above title are making progress and hope to soon have the matter in shape for presentation. A great deal of correspondence has been received on the subject by members of the committee, and all phases of the question are being carefully considered with the purpose of treating all interests with fairness. In the state there seems to be a general desire for the passage of such a law, while outside of the state it is generally opposed, largely, it would appear, from a misunderstanding of the ends sought to be accomplished and the means to be employed. Some such legislation as this is sorely needed. We hope to have a copy of the bill for publication in the next issue and to report progress.

THE IOWA STATE HORTICULTURAL SOCIETY, DEC. 15, 1898

THE MINNESOTA HORTICULTURIST.

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CENTRAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

Members of the Minnesota Horticultural Society:

It gives me great pleasure to have the privilege of making my eleventh annual report to you on the progress made in horticulture at the experiment station. This report will necessarily be brief, on account of the crowded condition of my work, and will be confined to general matters, the results in greater detail being reserved to be reported on in a bulletin later on.

The Horticultural Division of the Experiment Station has issued no regular bulletin during the past year, but instead has gotten out a manual on forestry of 311 pages, ten thousand copies of which have been published by the Minnesota Forestry Association for gratuitous distribution in this state. This publication is designed especially as a text book on forestry for our classes in the school of agriculture, but it contains our observations on this subject up to date and in reality is a public bulletin on this subject.

The year, as a whole, has been very satisfactory. Increased interest in the experiment station and school of agriculture has been very evident. We have had a larger number of students present during the past year than ever before at any one time, and, as a whole, the students coming to us have had rather better preparation than heretofore, which has made it possible to somewhat increase the scope of the work. There has been no change in the staff of the experiment station.

Among the fruit crops, apples naturally come first for a few words. Our so-called Russian orchard, which is situated on the

flat, open prairie, is doing surprisingly well, and this year the larger trees in it gave a moderate crop of apples, so that perhaps thirty barrels were harvested, most of them early kinds, such as Borovinka, Duchess and Charlamoff. Our other orchards of bearing size were also quite productive, and the outlook is that at no distant day we shall have a surplus of fruit to dispose of. Our seedling orchard has made very satisfactory progress, and while it is not old enough to bear yet it has made very satisfactory growth, and it looks as though we might get very interesting results from it. Nearly three acres have been planted in the new orchard, which has been filled entirely with kinds of most promising hardiness. It is the intention to make this a modern commercial orchard rather than an experimental orchard. This seems advisable from the fact that so few people seem to be able to interpret the vacancies which must exist in an experiment orchard, but rather look upon the death of trees as discouraging, yet in reality the vacancies oftimes give us most valuable lessons. It is my intention to keep this orchard thoroughly well cultivated. On the approach of winter all the trees were laid flat on the ground and covered with soil and mulch. Such position not only prevents climatic injuries but protects from mice and rabbits.

On our grounds the Hibernal and a number of other varieties of trees are rather tardy about coming into bearing, and in '97 I girdled a few of them with the object of hastening the fruiting period, which it has done very successfully without apparent injury to the trees.

Our crop of plums was very light, only a few varieties fruiting heavily. I was not sorry for this, though, as our trees have overborne for several years past and needed a chance to make wood, which they have done the past season.

Our vineyards have pretty well recovered from the severe winter injury of two years ago and this year gave very fair crops of fruit. We have planted a new vineyard in the garden, and it is the intention to do away with the one on the hillside opposite the Drill Hall as soon as this one comes into bearing.

I have been rather interested this year in trying to keep grapes in an ordinary cellar, and have had the best success with the Lindley, though the Agawam has done very well. By packing them in the cellar in dry sawdust I have been able to keep them in good edible condition until the latter part of February, at which time they were crisp and of good flavor, with the exception that they had taken up a little of the taste of the sawdust. I believe that such long keeping kinds as the Agawam and Lindley, which bear very well in this section, should be grown to a greater extent, for the reason that they keep such a long time and are very productive.

The crop of raspberries was remarkably good, and perhaps never before did we have such an abundance as the past season. I would call especial attention to the Loudon as being, in my opinion, the best red raspberry for general use for the market or home. The King is an early red raspberry, but scarcely earlier than the Loudon, and while fully as productive early in the season it does not hold

on so long and, consequently, does not yield nearly so much fruit. The Columbian raspberry is wonderfully productive. It is a very strong grower, and yet we are able to get the canes on the ground and cover them remarkably easily for so large a variety. It has the quality of suckering out near the ground and producing long fruit laterals, and even if the top is frozen back severely we are pretty sure of a good crop from this variety. I am very much pleased with it as a home berry. For market purposes it is too dull in color and looks stale even when first picked, and on this account will not bring a good price in the market in competition with the Loudon and other bright red raspberries.

Our best early blackcap is the Progress. For a number of years it has done remarkably on our grounds.

Currants and gooseberries produced good crops this season with us, although they did not bear quite so heavily as last year. We still think the Champion gooseberry the best of its kind for all purposes, and although not quite so hardy as the Houghton yet it is well worth the extra care required in protecting it.

Our forest plantation has been somewhat increased in size by the addtition of hackberry and a large number of evergreen seedlings, and we expect the coming year to bring it up to its limit of five acres. The growth of this plantation has been quite remarkable and attracts much attention from those who are interested in forestry.

A fine lot of red cedar seed which had been sown in the spring of '87 started beautifully in the spring of '88, and we have as a result a very nice stand of this most desirable evergreen grown from Minnesota seed.

The ornamental features of the grounds have received their full share of attention, and the grounds about the girls' building have been graded and planted, and a large amount of shrubbery and trees have been planted along the line of the tunnel which was put in last year. These include many desirable and promising novelties and a good collection of named peonies. The trees, shrubs and herbaceous plants on the ground have made a very satisfactory growth and are now of sufficient size so that they add very much to the appearance of the campus.

Among the new shrubs that are very interesting is Rhamnus Alpinus, which is a beautiful shrub with large rugose, oval leaves. As yet this very desirable novelty is offered by but few nurserymen and at a very high price. But judging from its appearance on our grounds for about five years, it is one of the new things that it will pay us to tie to. It is very easily propagated by layers. I do not know that the seed of it can be obtained in this country and think there are no plants here old enough to produce seed.

A considerable amount of seed of the different varieties of apples has been sown the past year with the idea of increasing our seedling orchard.

EXCELSIOR TRIAL STATION.

H. M. LYMAN, SUPT.

There has been a fair crop of apples about here the past season where the caterpillars have been kept in check by spraying, hand-picking and other ways. Where not sprayed the caterpillars took everything in sight in the apple line, unless, it may be, in a few instances where the orchard was remote from timber. I have not noticed many eggs deposited in the timber this fall, so I think we may reasonably expect to be nearly free from them another year.

Trees have made a good growth and have well-ripened wood and look as if they would stand a fairly hard winter's freeze. However some of the very young trees have continued to grow until quite late and will doubtless kill back considerably.

I sprayed most of my trees with London purple, which was seemingly very beneficial in producing plump fruit, although I think it would have been better to have sprayed once before the blossom formed. As our orchards grow older we shall have more trouble from the ravages of insects, but by judicious management we can surmount all such obstacles against fruit growing.

Of varieties I have on trial, I would place the following as quite hardy: Charlamoff, Christmas, Rosa Repka, Lubsk Queen, Anisim, Antinovka, Harry Kaump and Patton.

The Lowland Raspberry is a very good early apple and will stand quite a degree of cold. It is somewhat subject to blight, although not as much so as the Wealthy. The Longfield, Malinda, Utter's Red and McMahon are about in the same degree for hardiness and will not stand a severe cold winter; therefore, they should be top-worked on hardy stocks. I have the best results in grafting them on hardy Minnesota seedlings that have originated from Siberian stock.

In regard to seedlings: I find that seeds from the Wealthy apple produce fruit of larger size and better quality than all others that I tried, and most of them are longer keepers than the Wealthy and of high quality.

The Martha crab is rather late in coming into bearing, but very free from blight. Would it not be a good stock to graft upon? The tree is an upright and fast grower.

I have practiced girdling in the past for early bearing but find that varieties which are at all subject to blight had best be left out. I have never been able yet to cause the Peerless to blight by girdling, and there are also several other varieties that are equally free from it.

EUREKA TRIAL STATION.

C. W. SAMPSON, SUPT.

Small fruits, plants and grape vines came through the winter of 1897-8 in excellent shape with the exception of red raspberries, which were badly winter-killed where the canes were not laid down. The Turner, one of our hardiest varieties, was killed to the ground. The only safe way is to lay them down and cover with earth. Strawberries came out in good shape and bore a very heavy crop, owing

to the bountiful rain-fall in May and the early part of June. Blackberries bore a light crop on account of the drouth in July and August.

The grapes came out in fine shape and bore a good crop. Moore's Early were the first to ripen; we began picking them August 20th. Delaware were ripe September 1st, were quite free from mildew, and the little white hopper was not nearly so bad on them as the year previous.

Plums blossomed full, but the curculio stung nearly every plum, and they dropped off. They were a very light crop and brought $2.00 per bushel.

Apples were a light crop, and most of them were knotty and ill-shaped. Where they were sprayed thoroughly, they were a much better crop and were nice and smooth. It pays to spray the apple trees. Wealthy apples brought from $1.00 to $1.50 per bushel and were one of the best paying crops in the state. The Campbell's Early and Alice grapes made a good growth but did not fruit any this season.

LA CRESCENT TRIAL STATION.

J. S. HARRIS, SUPT.

The following, a continuation of the midsummer report published in the magazine for August, 1898, page 286, which includes the fruiting of the strawberries and well into the raspberry harvest, also gooseberries and currants. The blackberry crop, which at the date of last report promised to be very abundant, turned out to be almost a total failure. They appeared to be all right until a few berries had developed and begun to ripen, when the bulk of the fruit ceased to grow and dried up or dropped prematurely, scarcely enough maturing to satisfy the birds. I am unable to determine the cause, but think it is some fungous disease that struck the fruit suddenly. The plantation is on deep, rich, valley soil. The plants had not been unusually severely cut back in the growing season of the previous year. Only a portion of them were given winter protection, and they proved no better than those left without any protection. The plants have made a vigorous growth this season and appear to be healthy and well ripened.

Plums with us were a light crop, and the fruit of poorer quality than usual. As with most varieties, the greater part of the fruit dropped before half grown. The failure is largely attributed to imperfect fertilization. No bees are kept on or within one mile of the place, and other beneficial insects that work on the bloom were unusually scarce at that period.

The season was an unusually good one for cherries, and a number of the trees furnished us from the state station, and set in the spring of 1896, brought considerable fine fruit, the Wragg and English Morella bearing better than the Early Richmond and Montmorency.

The grape crop was unusually large, not only with us but in the vicinity, and the quality was better than the average. No frost occurred to injure the foliage before October 15, and even the latest

varieties ripened up perfectly. After a pretty thorough test of a great number of varieties, I offer the following list as the most desirable and valuable for general cultivation in southern Minnesota, viz.: Moore's Early, Worden, Early Victor, Delaware, Brighton, Moore's Diamond, Niagara, Concord, but do not advise planting largely of the Early Victor for market purposes.

A considerable number of young trees in the trial orchard bore a few specimens of fruit, but hardly enough to determine their value. About thirty new seedlings have fruited but will not be given names or numbers at present, as it is not probable that very many of them will prove worthy of propagation, and, in fact, we have already destroyed one-third of them and many more that have never fruited, either because they showed remarkable signs of a lack of hardiness or vigor, or were great blighters and were not desirable to use for top-working. Few of the Russian varieties outside of the Duchess of Oldenburg family, viz.: the Hibernal, Anisim, Breskovka, Longfield, Antonovka, Ostrekoff, Bode, Cross and Yellow Transparent, are likely to become popular for orchard planting in the more favored portions of the state. The Red, Yellow and Pink Anis have no value here, as they are not good bearers and what fruit they produce drops too early or while the Duchess is in season, and they have no commercial value.

The Russian Green and the Blue Anis would be desirable if the fruit would hang until the proper time for harvesting them. As some of the varieties of the Anis family appear to be more hardy than the Duchess and Hibernal, they will likely prove of great value for the extreme northern limits of apple culture. But little spraying for insects and fungous diseases has so far been done, but the little done showed very favorable results, and more will be done in the future.

The worst pest we have to contend with is the gouger, which is very injurious to the fruit of some varieties, causing it to be knotty and ill-shaped. So far, I have not found any perfect remedy, but am satisfied that frequent spraying with Paris green and jarring the trees, catching the insect on sheets and destroying them, greatly reduces the number, and if continued over two or three years may exterminate them.

For the codling moth, in addition to spraying, we have found that placing bands of burlap folded two or three thicknesses and five or six inches wide about the trunks of the trees, eighteen inches above the ground, drawing the top edge tight and fastening with a string or large tack, leaving the lower edge loose so that the larvæ may hide under it for propagating, is a paying operation, greatly reducing the number of wormy fruit of the later ripening varieties. The bands are put on about the first of June and taken off, examined and all larvæ under them crushed, replacing them about every nine or ten days, during June and until middle of August, after which they are left until all fruit has been gathered. About the first of November they are all removed and put away for winter, and every larvæ found under them destroyed.

The plantation begun in 1896, on the rather steep slope on the north side of a high bluff, is promising remarkably well. The tim-

ber is chopped off but not grubbed and holes dug for the trees in the previous fall, and they are planted out without plowing the ground. Keeping sprouts away from the stumps will kill the roots, after which they soon decay. Here we have no sun-scald and less blight than on other locations. Another acre is being cleared for planting, on which about twenty-five additional varieties will be placed on trial. By the time the next annual report is due we hope to be able to note that a considerable number of varieties have fruited and give descriptions of the fruit.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

Strawberries.—The Bederwood and Warfield took the lead in quantity and in quality. Gardner and Mary yielded good crops; Wm. Belt and Marshall gave a light crop; Brandywine a little better; Weston, Greenville, Dayton, Arrow, Capt. Jack, Crescent, Michaels, Lovett, Timbrel, Parker Earle and Babcock were not up to the usual size nor productiveness.

Red Raspberries.—Red raspberries were injured by late frosts. Even where they were protected by laying down for the winter, the canes were injured after by being taken up. Aphis and other insects were quite prevalent, so that only about half a crop was harvested. Cuthbert and Loudon were among the best. The Miller will be discarded. The fruit is too soft and insipid compared with others. Golden Queen will do for home use but is not good for marketing.

Blackcaps.—These were an excellent crop, the Palmer holding its place as the best early, and the Gregg and Nemaha for later kinds. Neither blacks nor reds have needed winter protection at this station.

Blackberries.—They were a large crop. The Snyders did the best, with Stone's Hardy following. Briton's were later and injured more than others by drouth. The Badgers were about the same as Snyders in quality, season and quantity.

Currants of all varieties were abundant and fine in quality.

Gooseberries.—The Pearl and the Columbus bore very well. The Columbus mildewed in places.

Grapes were an entire failure here. The blossoms failed to set fruit.

Cherries did not bear heavily, but the fruit was unusually fine. The Russian varieties appear to be well adapted to our conditions.

Plums.—All varieties of natives bore heavily. The size of the fruit was smaller than usual, and the later kinds suffered with drouth. Russian plum trees bore no fruit. The Japanese bore a few plums of fine appearance. The natives will probably be found to be the most reliable and profitable.

Apples were a large crop, and more free than usual from insect pests.

Trial stock of all kinds made a vigorous and healthy growth.

OWATONNA TRIAL STATION.

E. H. S. DARTT, SUPT.

In surveying the field of experiment in Minnesota, nothing presents to us such strong evidence of substantial and rapid progress as the varied results of fruit tree girdling as now practiced at this station. Previous to commencing in this line of experiment we had no way to hurry up tardy bearers except by the tedious method of top-grafting, which is a modification of the same principle that is involved in girdling. We had no way to test the hardiness of a fruit tree except to wait indefinitely for the advent of a hard winter, such as the present one promises to be. Under these conditions it would likely take fifteen to twenty years to produce and test a new seedling apple tree as to its hardiness and the kind of fruit it would bear.

Now conditions are changed, and we think we have the fruit tree under perfect control. By this simple, easy and practical process we can, in a year's time, cause the development of the young tree and soon bring out all its natural characteristics. If it is tender or predisposed to blight, it will likely be killed, but if it is hardy it will accommodate itself to these little encroachments on nature's laws and will be ever ready to comply with all our reasonable requirements.

Hotchkiss, 2 inches in diameter.

If we girdle a thrifty tree in May, the wound is likely to heal over perfectly during the growing season, and no effect is produced. But on July 1st, the elements of growth are being taken in rapidly through the leaves and are being distributed to every part of the tree, and if we girdle at that time, cutting through the cambium layer, we stop the downward flow of these elements, which being held in the top of the tree naturally cause the formation of fruit buds to be developed the next season. Watersprouts frequently start below the girdle, which should be removed.

The manner of girdling is not very essential, and after trying various methods I have adopted the spiral method, partially because it seems less shocking to the nerves of those sensitive people who believe that to girdle means to kill. Girdling by the spiral method is accomplished by starting in with a saw just below the

limbs and cutting down around the tree at an angle of forty-five degrees. If the cut extends a little more than once around no harm will result; if the saw is turned square around the tree the effect will be the same. On small trees and limbs a knife may be used instead of a saw, but the fact must be emphasized that unless the cut is deep enough to disturb the cambium layer no results can be expected to follow.

About the first of July, 1897, a large amount of girdling was done by the spiral method in the orchard and nursery. A few trees were killed, but I think not one having a good reputation for hardiness and freedom from blight. In the orchard alternate trees, from two to four inches in diameter, were girdled. In most cases girdled trees were well loaded with fine fruit the next season, while on ungirdled trees generally specimens were few and scattering. So far as girdling was extended, it increased the crop fourfold.

In the nursery, trees were usually from an inch to two and a half inches in diameter and from two to six feet apart, being in nursery rows thinned out. Probably from three to five hundred of these trees, scattered over about two acres of ground, were girdled. Many of them were heavily loaded with fruit, and I think the crop amounted to about seventy-five bushels, while I did not notice an apple on an ungirdled tree. More than 100 varieties were thus brought into bearing, about fifty of which were exhibited at our last state fair. Ten or fifteen varieties were new seedlings of great promise.

In very fruitful seasons if we remove fruit and girdle at the right time we can bridge over the off year, and have fruit to sell or to keep in seasons of scarcity.

In a climate like ours where fruit trees are naturally short lived, and where our choicest varieties must slip along between our hard winters, which are often uncomfortably close together, none can fail to appreciate the great advantage of being able to bring our trees into very early bearing.

With more than fifty years of experience in orcharding in Wisconsin and Minnesota, and this recently acquired knowledge, I would plant Minnesota orchard trees eight feet apart in the row, extending north and south, with rows sixteen feet apart east and west. After two or three years I would girdle half my trees. The next season I would girdle the other half. After that I should attempt to control growth and productiveness by girdling. If a cold winter like the present killed down my trees, I would allow them to grow up again in bush form, branching from the ground, feeling very confident that with a little encouragement on my part they would very soon be found doing a prosperous business at the old stand.

Mr. Dartt: In regard to fruit at the tree station, I want to say I picked a large quantity, probably seventy-five to one hundred varieties, and they were exhibited with our county exhibit at the state fair. I did not stay until the fair was over, but I left word with our horticultural friends that they could have that fruit for this meeting if it would keep, but I think

they got only one or two specimens as some one there told them that I gave them the fruit, which was not true, and consequently the fruit from the tree station is poorly represented at this meeting. I brought along a very few and expected to find a good many more here, I have a list of promising varieties, about fifteen or twenty varieties, most of them apples; some of them I can remember and some I cannot. I want to warn you that there are thousands of seedlings in Minnesota that are now very promising, that I think will very likely go out with the next hard winter, but in my estimation my girdling is about equal to a hard winter. Some of those hybrids are good sized apples; they appear to be perfectly hardy. Some of them will make No. 1 crabs, and real good crabs that are hardy will prove profitable, especially where it is a little difficult to grow the standard apple.

Mr. Yahnke: Will the bark grow out again when you girdle a tree?

Mr. Dartt: The bark that is girdled will all grow out in two years in a thrifty tree.

Mr. Benjamin: When would you advise this girdling to be done?

Mr. Dartt: If you girdle the first of July it will bear the next season if it is a thrifty tree, and the next year it will be partly grown over. If we go into the merits of the case I believe we will have to girdle once in two or three years. The wound all grows over. The tree is not liable to die unless it is a blighter. It brings out all the perfections and imperfections of a tree. It is a test, it is a hardship, and the greater the hardship the better the test will be. If the tree is brought to early maturity it will bring out the value of the tree when it comes into bearing and produces its first heavy crop. Thousands of trees will grow until they produce a heavy crop, and then they die, and the method of girdling gives us an opportunity to note the "survival of the fittest."

The President: I would like to ask Mr. Dartt if some years there is less blight than in others? Has the season anything to do with it?

Mr. Dartt: I hardly think it has been an abnormal season. In regard to those seedling trees, I ought to say that I have girdled a good many of what I call untried seedlings. I expect that ninety-nine one-hundredths will prove defective. I do not think there is a quarter of them that will live among the seedlings.

A VISIT TO THE OWATONNA EXPERIMENT STATION.

J. S. HARRIS, LA CRESCENT.

On the 23d of August, of this year, 1898, in company with other members of the executive board of the State Horticultural Society, I made an official visit at the experimental tree station and trial orchard located at Owatonna, and made the acquaintance of E. H. S. Dartt.

We found the station in the best of order. It is securely fenced against thievish boys, dogs and rabbits. It is kept clean and thoroughly cultivated, and Mr. Dartt uses a system of record that obviates the making of mistakes and by which any variety can be found at once. The object of the station is: First, to conduct experiments in the originating of new or seedling varieties of the tree fruits with the view of securing varieties of sufficient hardiness to endure this northwestern climate and of a quality that will make them worthy of general cultivation in quantities sufficient to supply the wants of our rapidly increasing population. Second, to give all of the varieties recently imported from Russia a fair, thorough and impartial trial, as fast as trees and scions of these varieties can be secured. Third, to gather in and test such American varieties as are reputed hardy, and all seedlings of northwestern origin that do or have shown evidence of hardiness and of producing a good quality of fruit. Fourth, so to conduct experiments in propagation, cultivation, pruning, etc., in order to secure the best results and establish safe rules to govern the propagation and planting of trees in this state.

In the growing of seedlings a record is made of the variety from which seed is taken. As soon as wood can be grown a few grafts are made from each one of the seedlings that in vigor or otherwise show evidence of value and planted in nursery rows and given good cultivation, there to stand until they fruit, unless they show unmistakable evidence of being of no value; or, in some cases, trees that are most promising are planted in trial orchard before the variety has fruited. The same method is also pursued with Russian varieties and seedlings of good repute.

Among the seedlings produced at this station, a seedling a cross between the Tetofsky and a Siberian hybrid, and known as Dartt's Hybrid, has been freely used to work from. The result is a family of fruit ranging from small to medium size of great beauty, bearing a striking resemblance to the original Dartt's Hybrid, evidently quite hardy in tree, and some of them bountiful fruiters and, generally, the fruit only of moderate quality. From the observations we were able to make at the time, we are lead to the conclusion that none of them will prove to be late winter keepers or of great value for commercial orchards, unless it should be one or two of the parent's size and crab type. We do not recommend their being abandoned at once. Among the best we noted was Dartt's Hybrid No. 5, medium size, yellow and red striped, season September; Dartt's Hybrid No. 23; and Dartt's Hybrid No. 1, medium size, good tree, good quality; Seedling A, best crab in the lot; seedling C, large for a crab but of good quality—tree good.

Newer varieties doing well and fruiting heavily, were: Acker's Duchess, fruit above medium size, yellow and red striped, mild acid flavor, season, late September. Stubb's Iron Clad, medium size, greenish-yellow with light blush on sun-side, mild acid, fair quality, season probably early October. 'Mills' seedling, medium size, red striped, fair quality, probable season December; tree productive, blights some. Patten's Russet—not a russet but said to be a seedling of Perry Russet—medium to large size, good quality, season later than Duchess, tree vigorous, healthy and productive. Patten's Greening, fruit medium to large, good quality, season early October, hardy tree, medium vigorous, resists blight well and is very productive.

Northwestern Greening is doing well.

Yearly's Winter looked to be promising,—about as hardy as Wealthy and said to be a good keeper.

Phoenix Duchess No. 49 is a good tree, fruit medium size and good appearance but of indifferent flavor; season October.

A seedling of Duchess crossed with Rawle's Jannett is a fine and promising tree. I did not secure samples of the fruit.

Gideon's October scabs badly here, but the apple propagated under the name of Gideon (the true Gideon) is an apple of fine appearance and good quality; season early September.

But few notes were taken on the Russians, although it was noticed that many of them blighted very badly, and others are shy bearers. The best noted were Duchess, Hibernal, Charlamoff, Cross, Anisim and Longfield.

Hundreds of seedlings have been brought into early bearing by the process of girdling, but, in our estimation, the season of ripening, and quality, size and appearance of the fruit of fully one-half of them is against their being named, described or kept on trial, and we suggest that at their next fruiting a competent committee be appointed to assist Mr. Dartt in weeding out the unworthy.

As an orchardist and nurseryman Mr. Dartt has had large experience and shown himself to be fully competent to manage the station, and his management appears to be entirely satisfactory to the authorities over him, and he is entitled to such aid and encouragement from the State Horticultural Society as they are able to give him.

THE OWATONNA TRIAL STATION AT SHORT RANGE.

WYMAN ELLIOT, MINNEAPOLIS.

In company with several horticultural friends we visited E. H. S. Dartt, superintendent of the Owatonna tree station, that we might get a glimpse of his methods of tree propagation and girdling at short range. We found the work had been faithfully performed along modern experimental lines, and there were several hundred apple and crab trees fully laden with fruit, some very good but more without size, quality, or worthy of propagation. There was much at this tree station that would interest and instruct the ordinary layman in horticulture and which appeared to be of future value.

The station was started in the spring of 1887, with an area of five acres of prairie land, somewhat variable in character, from clay

loam to black, muck soil. The location is very well adapted to a work of this nature. Adjoining the station is the grounds of the home for the orphans and homeless of our state, on which there have been planted 800 trees in orchard from this station. These are just coming into bearing.

To attempt any concise description of the many varieties under trial would be impossible. There have been collected from ten states and originated on this place over 1,000 varieties of grafts and seedlings. The method of propagation has been by short piece root, top-grafting and root-cuttings. On inquiry we learned that the superintendent had not discovered that the method of propagation influences hardiness of the trees. The theory advanced is that varieties top-grafted stand better because they are up some distance from the ground and escape snow line injuries; also that scions of rapidly growing trees grafted into any root are likely to impart elements of growth to the root and *vice versa*; that the element of hardiness is not thus transmitted; and Bacon says: "The scion overruleth the stock, and the stock is but passive and giveth aliment but no motion to the graft." Here every variety is treated as near alike as is possible, and their behavior in the nursery is carefully noted in a record book for reference. Fertilization is left to the work of the bees. It is estimated that nearly one-fourth of the trees bore fruit this year, mostly from the effects of girdling. From what I saw, I should judge that a large percentage of the seedlings in fruit were of no value, on account of their small size, poor quality and propensity to blight. A few of these trees, no doubt, will prove valuable acquisitions.

The superintendent has great expectations from the use of girdling tests, to decide whether a tree is hardy or worthy of propagation; also as a means of controlling their bearing in the off years. The quality of some of the fruit was most excellent, but I failed to find any superior or equal to the Wealthy. The development of apple raising in our state as a successful industry depends largely in the future upon the experiment work done by the horticulturists and at our trial stations. What we most need is results good and plenty that will give added hopes to those who have been discouraged by past failures, and these can only be obtained by persistent investigation, seeking for the varieties that have the greatest number of valuable points recommending them for cultivation. Where there are so many climatic difficulties to overcome and so much ignorance about the principles governing fruit culture among a large class of our rural population, it requires extra effort to be made by the members of this society and their co-workers at all our experiment and trial stations to make this a No. 1 fruit growing state. We, as a progressive society and people, should not cripple this class of needed work by parsimonious appropriations for the support of intelligent effort to be done in developing hardy varieties of fruit for this climate. In conclusion, my individual thought is that the efforts being put forth along experimental lines at the Owatonna tree station will prove helpful and instructive to our horticulturists and should be continued, provided detailed reports are prepared, printed and distributed by bulletin and the press.

SAUK RAPIDS TRIAL STATION.

MISS JENNIE STAGER, SUPT.

We had a wonderful spring. Every tree and fruit plant was loaded with blossoms and fruit. Our usual hard spring frosts deserted us, and we were happy. We have never had a larger crop of strawberries, currants and gooseberries. But the worms came; not the ones whose eggs were laid in our trees and bushes; those were cut out and burned; but others that came in shoals from outside; and despite all our pains they did a great deal of damage to the other fruits. As the evergreens and other trees and bushes are full of their cocoons, we are afraid of another infliction next summer. However, I think we have learned a lesson that may help us if they come again.

VIOLA TRIAL STATION.

WILLIAM SOMERVILLE, SUPT.

Not being able to attend the late winter meeting of the society and not able to send in a report then, I felt it my duty to do so later that friends who have sent me stock for experimental purposes may feel I am not ungrateful. Our crop of small fruits was light, but we had sufficient for home consumption. Our apple crop was large but fruit small, especially the fall and winter varieties, in consequence of drouth. The market for early varieties and prices paid would not justify the picking and barreling of the fruit, and as we always make a hog pasture of our orchard we left them in all summer and fall, and as soon as the apples began to fall we ceased feeding. The hogs did well on the fruit, so that this fall we had a half hundred or more for the market that we did not feed over 100 bushels of corn to. So, if we did not get the profit in fruit we did get it in pork. Our fall and winter varieties we picked and sold for sixty-five cents a bushel.

As for my experimental work, I have had but little sent me for that purpose. Professor Green, two years ago last spring, sent me four plum trees. They have made a good growth, but have not fruited yet. Also, last spring through him I received from Professor Budd, of Ames, Iowa, nineteen varieties of Russian cherry trees, that I hope in a few years to give a good account of. I also received last spring from Mr. Penning, two Surprise plum trees, that grew well.

Five years ago last spring I received from Lake City Nursery Company some North Star currants, that produced more fruit than any other variety I have. They, also, since that time, have sent me a number of different varieties of gooseberry brush that have grown well and produced fine fruit; also the Aiken plum, the earliest large plum I have a knowledge of. The fruit is fair quality. They also sent me, five years ago, twelve trees of what they called Thomson's seedlings, six different numbers. I have watched them closely every year to see what effect the winter would have on them and believe them to be much hardier in wood than the Wealthy. They all fruited this year, several of them having more

than a bushel to the tree. The fruit was large, of a good color and fair quality. They hang on the tree well, as we did not pick ours till the first of October, and we have them in the cellar in good condition at this date (January 6.) They also, three years ago, sent me six numbers more, and they have nearly all fruited. Taking them together they were the finest lot of seedling apples I ever saw.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

There is but little to add to the midsummer report of this station.

The Breskovka was the first apple to ripen. The quality was good for eating out of hand. This variety seems to be a good bearer, a little subject to blight, but on the whole it is a most promising early variety.

The Borovinka is another apple that is doing finely. It may never become very popular on account of its being nearly identical both in tree and fruit to the Duchess. If there is any difference in those varieties, it is that the Borovinka has the larger fruit and may be a trifle later in ripening.

The Okabena bore a fine crop again this season. It seems to be an early and regular bearer, ripening between the Duchess and Wealthy. Its fine appearance and excellent qualities insure its being popular in this section.

We had some blight on some of the Wealthy apple trees this season for the first time. The Yellow Transparent blighted badly, and I cut down and burned most of the trees. The trees, such as the Whitney and Early Strawberry crab, that blighted so badly the summer of 1897, were entirely free of blight the past season.

My bearing trees of the Virginia crab were attacked by the apple scab. As this has happened on several previous seasons, I have about come to the conclusion that it may not be a desirable orchard tree. The Briar's Sweet was affected by the scab even more than the Virginia.

The plum crop was very light and of poorer quality than usual, owing in a manner to the curculio and plum gouger, which destroyed or malformed so much of the fruit—also to the drouth; and almost all varieties were injured badly by the plum rot. The De Soto, Wolf and Blackhawk were among those that were least affected by the rot. The Wolf seems to stand the drouth better than most other varieties.

I have found by years of experience that it is a very difficult matter to grow evergreens, no matter how hardy, on this windy prairie unless they have some kind of shelter, but with shelter—and the more the better—that Scotch pine, white and Norway spruce, cedars, Austrian pine and, probably, other varieties, may be grown nearly as easily as the deciduous trees.

I omitted in its place to say that the Florence crab promises to be of more value for market than any other crab that I am growing. The trees have shown no blight and bear heavily; the fruit is of a beautiful color and just the right size for a crab.

November 21 and 22, we had the worst blizzard for twelve years. The drifted snow is now, November 28, from two to four feet deep over the larger part of my orchard. The largest drifts are from eight to ten feet high, and some of the trees are completely covered over, and it looks now as though most of my orchard trees would have to pass the winter under the abnormal condition of the roots being in unfrozen earth. The result is awaited with some anxiety.

PETER M. GIDEON AND HIS SEEDLING APPLES.

ROLLA STUBBS, HULDA.

Quite recently the writer had the pleasure of visiting an old friend, Peter M. Gideon, the oldest horticulturist in the state. Notwithstanding the severe shock he had last summer from a horse kicking him out of his buggy, he is looking well and enjoying good health. He is just entering his eightieth year. He is as enthusiastic as ever in horticultural work.

Knowing that many of your readers would like to hear of his work, I will give it as he gave it to me. He says that his apple trees have gone into the winter in good condition; that he has 3,000 bearing apple trees and 5,000 set, mostly of his varieties of seedling apples; that he has 30,000 seedling trees raised from the seed of Wealthy and Peter apples. We may look for something good from these seedlings, and who knows but some of them may win the prize of $1,000 offered by the State Horticultural Society? He planted last fall enough apple seed from his own raising to make 50,000 more trees. During his care of the state farm he sent out 60,000 seedling apple trees over the northwest, from which he has heard good reports.

We think there is not another man in the northwest who has put in as much hard work and devoted so much time to apple culture as Mr. Gideon has, as he has devoted forty-four years of his time with a good deal of sacrifice to his home comforts for the sake of accomplishing his work of getting hardy apple trees and long keepers.

He has now between fifty and one hundred varieties of apple scions top-grafted on his hardy stock of trees that he has procured from all over the world at a cost of one dollar per scion for many of them. Wherever he could hear of a long keeping apple he sent for it.

In regard to the Peter apple tree. Many do not know the value of it. There does not seem to be much said about it in the reports of the horticultural society. The Peter apple originated from a seed of the Wealthy; it commenced to bear fruit in the year of 1882, and we think it is going to supersede the Wealthy, as it has a stronger constitution and is not so subject to twig blight. It forms a top much like the Whitney No. 20, with its limbs inclined upward, holding its fruit up well. It is not so prolific in bearing as the Wealthy, but the Wealthy bears too heavily for its own good. The apple in size, quality and color is very much like the Wealthy, but

is a longer keeper, Mr. Gideon having kept it till the last of August from the previous September, and many times until April and May.

He has a good many promising varieties of new seedling apple trees that promise to be of great value to the northwest, and as soon as they are thoroughly tested he will put them out to the public. Among the crabs he has one that is like the Transcendent in size, quality and productiveness, and there has not been a Transcencent apple tree on his place.

Mr. Gideon has been troubled with the tent caterpillar for two or three years on his apple trees and has not had as good showing of fruit as he would like. He says that when his best new seedlings get a full crop again and his orchard has a full crop, he will invite the fruit growers of the northwest to come out and see them. He hopes to have 100 varieties of apples at the state fair next fall, most of them being his own seedlings.

PROMISING APPLE SEEDLINGS FOR MINNESOTA.

J. S. PARKS, PLEASANT MOUNDS.

I will not attempt to describe particularly any one of the "Promising Apple Seedlings for Minnesota" that I have raised. I have never propagated in a commercial way from any of them, and only know from the actions of the seedling tree what might be expected of them if propagated and planted in other sections of our state. I have out of about one hundred bearing seedlings, say, forty that seem to have merit and good qualities enough to recommend them for trial. I find it easy to raise seedlings that have *some* good qualities, but to get one with *all* the requirements of hardiness, size, eating, market, keeping, etc., is quite difficult. Of course, hardiness is the first consideration—no earthly use if not perfectly hardy; then keeping—we have enough good early varieties; then size—we have too many small ones now. Now that we are getting to be of commercial importance and raise fruit to feed the northwest, we must have good shipping and setting varieties. We have at this writing, December 1st, about forty varieties keeping in fine condition. Some, I know, will keep until April or May, and good while they are keeping.

The seed I used came mostly from northern New York and Canada, and was mostly from long keeping varieties, which may have some influence in furnishing so many good keepers. My plan was to sow the seed in long rows and let them grow and die as nature dictated, and depend on the "survival of the fittest" for my stand of bearing trees. In that way all tender plants—and they were numerous—gave way, some early, some later, and in that way only the hardy trees were left to care for and to watch for their development. Out of about 2,000 seedlings we have about 150 that have braved the elements of Minnesota extremes of heat and cold, and we expect some of them to be of service for future generations.

THE ECONOMIC VALUE OF SHELTER BELTS.

S. M. OWEN, MINNEAPOLIS.

The economic value of shelter belts, who can comprehend it and in what terms shall it be expressed? In dollars it cannot be and, fortunately, does not need to be, to be consistent with the subject given me for brief discussion. "Economy" or "economical" does not always imply a consideration of money. To be well and wisely ordered, to get the best and the most out of a given condition or situation is economy in its truest and highest sense. The things most precious to us, that contribute most liberally to all that makes life most worth the living, have a value too high and holy to be expressed in those base and sordid things that we call dollars. We lay down life for those we love, offer ourselves as bloody sacrifices upon our country's altar, wear the martyr's crown as the price of our devotion to principles; but who will attempt to state the money value of the love, the life, the devotion, the blood or the crown?

One builds a house with a view to excluding cold, which is designed to save fuel, but the saving of the cost of fuel is an infinitesimal part of the real economic value of the warmly built house. There is the comfort, the exemption from colds, from disease, from the possible death of some precious little member of the family circle. From this standpoint where will be found the hardihood to declare that the advantages from constructing that dwelling so carefully and wisely can be computed in dollars and cents? There will be found none to deny that the greatest economic value of the construction is in the things that cannot be expressed in money.

An ample, properly located windbreak is grown around the house, its protecting arms embracing the dwelling, the barns, the stables and the sheds. There will, perchance, come to view the scene some pedantic scientist, with mind and inclination attuned for statistics and mathematical calculations, and he will proceed to estimate the money value of the windbreak by demonstrating the saving of food to animals and of fuel to the dwelling, consequent upon the lessened degree of temperature in and around the buildings because of the neighboring trees. The scientist will be right; the saving he computes and asserts is realized, but what an immeasurable distance he is from expressing the real economic value of that windbreak!

When the polar legions of Boreas come charging across the prairies, up the valleys or over the hills; when he comes with his cavalry of the winds and infantry of snow, each soldier armored in ice, and exhaling breath that makes the mercury hide its diminished head, he finds the home intrenched within ramparts against which his apparently invincible hosts hurl themselves only to be broken into impotent fragments, robbed of their power and disarmed of their terror, by the swaying, elastic but resolute and valiant "home guard" of trees. In the light of such an attack and such a victory, who will attempt to put a money value upon the services of those splendid defenders of our homes? But if we cannot compute by any measure of value known of finance the worth of the service of the windbreak in the winter, how shall we compute by the same

measure its still greater worth, if possible, in the summer? When the attempt is made to conquer or raid the home with hosts of fire instead of frost, when blighting winds would do the work that those of ice failed to do, when the blistering heat of a northern summer sun supplements the work of the couriers of fire it sent ahead, and when each evil influence is thwarted by our soldier trees in their mailed coats of living green, who will think of saying that those soldiers are worth a given number of dollars and cents, or that their true value can be stated in gold or silver, or any other of the world's materialistic dross? Can a price be put upon the cool, refreshing shade that all animals, human and brute, luxuriate in? Can we con by rote, translate, put into books and sell for money the language and the music of the trees as their leaves are played upon by passing breezes? Yet who that has once communed with trees, or who that has been lulled to sweet slumber and pleasant dreams by the soft lullaby of rustling leaves as they coquetted with the night wind, would name the price that would induce him to part with such associates and to be deprived of such blessed communion? The true economic value of the windbreak or shelter belt must be stated in terms understood by the heart and not by the purse. It must be told in the currency that passes at the throne of God, that is coined of the highest sentiments, the best parts and the purest aspirations of man.

It would be as easy to give the economic value of the mother's love for her baby, of her tenderness and solicitude, as of the trees around the home. But in this very value of trees lies the strongest inducement for their planting. Let us learn and let us teach the true, the real, the indescribable and unmeasurable value of trees, and we will have done our best to increase their number, profit ourselves in the noblest way, and most surely bless those who are to come after us.

The President: I would like to ask Mr. Owen what per cent of homes he thinks there are on the prairies and in Minnesota that are sharing all the blessings that he has pictured.

Mr. Owen: During the past fall I traveled in Minnesota a good deal. I traveled probably three or four hundred miles across the prairie in private conveyances, and while I shall not endeavor to give the percentage of homes I saw destitute and unprotected by trees, I was cheered everywhere I went, at almost every hour of my travels, and also in my rides by rail, by the evidence of the rapidly increasing number of tree protected homes in Minnesota. I remarked to the companion I was traveling with that some of the most attractive places I saw were, I remembered, prairie homes where ten or twelve years ago, or when I was a very fresh resident of the state, there was an entire absence of tree protection, and even within these few years I noticed the trees had grown up in sufficient number and of sufficient size to form a most excellent protection, where in

those earlier days there was not even a shrub or flower or anything in the way of vegetation. I remarked to a friend the other day that I believed there were more trees growing in Minnesota today than there were ever before. It may not be such large trees, of course, and not so valuable from a commercial standpoint, but from the point of number we are actually planting and growing trees so numerously that in number, starting from the little fellow that is large enough to assert itself as a tree, we have more trees than ever before in the history of Minnesotn.

Mr. C. L. Smith: I notice what Brother Owen says about the number of trees, but I spent this past season considerable time north of here,—and we are now south of the center of Minnesota, and this is a timber country up here,—and one thing I was impressed with was that we do nothing to urge those people who are living there and trying to make homes for themselves to save trees around their buildings. Down in Brother Richardson's country, where there were no trees to commence with, they are better sheltered by trees than they are up here in Isanti county where they had to clear off the timber to build their homes. The people are leaving their homes less protected in timber districts than they are on prairies. In Freeborn and Houston counties twenty-nine years ago they planted groves, and they are properly arranged to get the benefit from them, but up here you will notice hundreds of homes on the St. Paul & Duluth road where they have stripped their places of every stick of timber, and they get the full force of the cold winds of winter and the hot suns of summer. The horticultural society should do something to educate these people against the destruction of trees around the home.

Mr. Seth Kenney: Don't you think the climate will teach those people pretty soon to plant trees there?

Mr. C. L. Smith: Yes, but it will be too late. They will have destroyed them and must begin over again.

The President: I took a drive yesterday nine miles southwest of Hastings through a rich part of the prairie country, through a German settlement, of very well-to-do Germans, and I did not see a single residence that was protected with a shelter belt of any kind. Some houses were entirely unprotected, not a tree around them.

Mr. Dartt: What was the reason?

The President: I do not believe they appreciate that they can have anything better than they have got. What I was most impressed with was the necessity and the importance of teaching those people the value of evergreens. They cannot have the same in the western as in the eastern part of the state, but when it so easy to have an evergreen screen around the place it seems to me they ought to be taught how it is possible to have an evergreen shelter to break the cold blasts of winter. Mr. Owen may have seen something in summer when the leaves were on that impressed him, but how is it in winter? You ride across the country on the railroad,

and even where there is a grove the house and barn will be away from it without any protection. I think this society can well do more; it can teach those people in the woods to save the trees around their homes and to plant trees where the timber has been devastated by the axe, and teach those new settlers that it is not necessary to destroy the protection they now have, and thus they can protect their homes from the cold winds of winter and the hot suns of summer.

Mr. C. L. Smith: I would like to emphasize a little bit the value of this teaching. I used to be quite frequently in the southeastern part of the state, particularly in the early days of the farmer's institute work. Brother Gregg will remember when we once got snowed in at Grand Meadow. There were a great many people at the hotel and among them were some German farmers who lived in that vicinity, who did not have an evergreen or any other kind of tree around their homes. I put in my time talking about the necessity and the comfort of having the home protected by having a shelter of evergreens, and the comfort it would be both in summer and in winter. I had not been down in that district for a number of years, but last fall I was down there again at the same place, which is on the Chicago & Great Western road. A great, giant farmer, a German, came up to me and called me by name. He said; "You do not know me, but I know you. I want you to come to my home; I want to show you the work you and Mr. Gregg did the time you were snowed in at Grand Meadows. You recollect the Dutchman who quizzed the life out of you about planting little evergreens? Well, I want to show you what I have done." I went with him to his home about three miles away. We drove in from the street through rows of evergreens ten to fifteen rods long, and then looking out from there it appeared as though the house and barn were set in a forest. He told me he had put five thousand trees around his house and barn. He had got little seedlings and put them out in the nursery and garden and then distributed them to the German farmers in his neighborhood, over 150,000 evergreens, and Mr. Scott, the banker, told me he did not believe there was another neighborhood in the whole northwest where there were so many farmhouses protected as there were in that prairie community. That German farmer learned his lesson well some thirteen or fourteen years ago. If we could get one of those Germans to plant trees the rest would imitate him.

Mr. T. T. Smith: In the section of country the president speaks of, the farms are owned by people in town and rented.

Mr. Clark: I want to speak of one point along this line. Some twenty years ago I first visited Brainerd—and those of you who have been there will remember that there is an open space south of the depot and the business part of the town, but when I first went there that was covered with a beautiful pine grove. Some two or three years after they went to work and cut off all the trees. As I went along from store to store I told them I thought they had done an outrageous thing to cut off those trees. A few years ago they started north of town and left a whole square of evergreens. They became sick of not having any trees nearer the business portion of

town. They went to work and covered this whole space from which they had cut the pine with deciduous trees, and they are now ten to fifteen feet high.

Mr. J. S. Hartwell, (Ill.): I was not expecting to speak on this topic this afternoon, but I have been intensely interested in the discussion. Our friend over here in this corner has hit something of the key note that ought to be sounded a little louder than he sounded it. This Dutchman who has done such wonderful work in his home and community did not gather his information from this or any other society, he gathered it from personal work in his home.

HORTICULTURE IN THE PUBLIC SCHOOLS.

I take it that most people in this world do the best they know how in the average, and, as a rule, those people are absolutely ignorant of the fact that those things would be an addition to their homes. Your society, if I remember rightly, has been in existence thirty and odd years. We have been preaching this same gospel in Illinois for upwards of forty years, and we have had some splendid men to preach it, the Bryants, Douglass and others, and notwithstanding as much as we have done we have as much to do in the older state of Illinois as you have in the same line, and we are still hammering away but apparently making no progress. We have three organizations, called horticultural societies, composed of certain districts, besides the state society, that are hammering away at this same thing. We have these same gray haired men coming in year after year and pegging away at it, and occasionally a young man steps in to fill the ranks, but we do not seem to make any progress. We have a gospel to preach in our state, and I want to preach it here, although it may be "carrying coal to Newcastle." The only way in which you can make permanent and visible progress along these lines is to put the matter right into your public schools. Start with your children if you want to make any progress. The child in his lesson will learn to love the beauty and poetry of the trees and flowers and will care for them ever afterward. Start this thing in your city schools and in your country schools, and you will find the question eventually solved.

Mr. C. L. Smith: I think it is well enough to inform Brother Hartwell that we are ahead of Illinois. We are teaching these things in our public shools, and you may go out among the children of the city of Minneapolis, and those who have been from three to five years in the city schools will tell you all about forestry. They are learning all about the trees they have planted at different times, and the matter has been carried into the district schools of the country and we are making wonderful progress along these lines. As Mr Owen said, there are more trees in Minnesota than there ever were before. Brother Cook says he had little evergreens sent him some nine or ten years ago as samples. Those samples are all over the state. The reason I mentioned this incident about the German is to show you that our work is bearing fruit. The progress we are making is shown by the interest taken by the young men, like the secretary of the forestry association. Our old and worthy secretary is dead, and some say I ought to be. But we are getting the boys

interested in this society, and we are taking the matter into our public schools.

Mr. Hartwell: I cannot help but congratulate you: it is one of the most encouraging things in the world to see such a live organization as you have here.

Mr. A. K. Bush: I believe we struck the key note in the suggestion that we need horticulture and forestry in our public schools, and I have urged that a text-book like those Prof. Green is getting out might be used in our schools, and I believe our Minnesota Horticultural Society should get at the back of the movement and interest itself in it; I believe we would hear from it immediately. It was with that thought in mind that I suggested that our surplus reports be placed in the libraries of schools. That is the place to do the work, and that is where the work will count.

Mr. Harris: I did not intend to speak on this subject, but it is a fact that the interest in tree planting is increasing almost beyond our fondest hopes. The right way to make the greatest and grandest progress is coming through the students attending our farm school here. They are taught how to plant trees and take care of them, and if you can put one of those farmer boys every ten miles over the state in ten years you will see a wonderful change in this state. You will see evergreens all over Wisconsin and Minnesota. See down here at Viola our old friend Somerville has a profusion of evergreens on his place, and all his neighbors have them. Down at Pewaukee, Wis., you will see the evergreens planted by old man Peffer. He had a large foot that extended over a great area of country, and hundreds followed in his footsteps. At Milwaukee a man, who was once a member of our society, living near Chatfield, years ago started planting evergreens, and for miles they have evergreens around that city in their lots and gardens, and they say it is all a result of the influence of that one man. And I believe the three or four hundred students that will be scattered out within the next three or four years will make their influence felt in such a way that within a very short time we shall see abundant results all over the state of Minnesota.

Mr. Spencer: For forty odd years I have been working for education in Minnesota, and this discussion of what should be in the common school touches me in a tender point. I have seen a good many schoolhouses with beautiful groves around them, and I have seen many groves where the trees were used for hitching posts, but I think a change for the better has come, and the state superintendent will be able to tell us how the thing is getting along in the district schools and how many shade trees are set out during the year. For a number of years I was connected with an educational journal in the state, "School Education," and we prepared for every Arbor Day exercises calling the attention of the teachers and pupils of the state to this work of tree planting. Those exercises go in one form or another to all the schools of the state, and through the teachers of the state considerable has been done. My heart was made glad to see that many schoolhouses had groves of trees about them, but there are yet hundreds of schoolhouses throughout the state that have not a solitary tree around them, and there are still more hun-

dreds that have not anything that would pass for a windbreak or shelter from the winds of summer or winter. In a recent visit along the Great Western railroad I saw twelve schoolhouses that stood facing the west, and only three of those twelve had trees about them. After all this work you are doing, after all this talk in the teachers' institute and after all this hammering away at this subject of tree planting, there is a great deal of room for progress yet in that direction.

I want to most heartily commend all that has been said about the teaching of forestry in schools. I want to say it has often suggested itself to me that there should be teaching of forestry outside the schools. I have noticed, speaking of these windbreaks and shelter belts around the homes, that very rarely do you see any around the schoolhouse, and it is the most dolesome, miserable, repulsive looking scene that can present itself, and the traveler sees as he travels through Minnesota a great number of schoolhouses absolutely destitute of trees, with nothing to break the monotony whatever. If I had the power I would compel the planting of groves around the schoolhouses to be a part of the contract entered into to build a schoolhouse. I would regard the grove around the schoolhouse as important as the roof that covers it, and would make it a part of the school and have the pupils that go to that school realize and enjoy the benefits of the trees that grew around it, and that would be teaching the most effective lessons in forestry that could possibly be taught. So I would say, as this society has not the power to do that, it would be well for this society to use its influence to compel by law the planting of groves around the common schoolhouses of the state.

Prof. Hansen, (S. D.): About horticulture in the public schools, I will say that while the United States is ahead of the world in almost all things, there is one thing in which we are fifty years behind Europe. Four years ago I visited some of the leading horticultural schools in Germany, and in some of those I happened to be present over a week where a class of school-masters were taking a course in horticulture. They had attended a two weeks' course in the spring and had now come back for a two weeks' course to finish up. They told me all about the German system. Connected with every German schoolhouse is a small orchard, nursery and garden. School children from seven to eight years old are taught how to graft and how to take care of trees, and all the details of horticulture are taught along with the A, B, C. It has been the work of Dr. Stoll, of Silesia, and it has been carried on for the past fifty years, and to a large extent it has been broadened each year. It is now found in all the schools of Germany and other countries of Europe. If we should adopt European methods in this line, we might find many problems worked out for us. In this matter of teaching horticulture in the schools, we are far behind the nations of Europe.

TOP-WORKING THE MINNESOTA ORCHARD.

D. F. AKIN, FARMINGTON.

This subject must include in its scope the various different ways of grafting, budding, pruning and thinning. Some one asks, what is the grafting done for, and the answer is, to get better fruit than the tree now gives, to increase a good variety or to get fruit sooner. This proves that no tree that bears good fruit should be grafted—"the tree that doth not bear good fruit shall be cut down." Nor should any seedling be used as a stock for grafting till it shows what kind of fruit it will produce. In doing this Minnesota has, no doubt, lost more varieties of splendid seedling apples than are shown at this meeting. From the above we conclude that no orchard which bears good fruit should be top-worked.

Another reason for not top-working the orchard is that cutting off the limbs at the time when it is believed grafting, to be a success, must be done, causes the tree to blight. As a proof of this, I set out a row of one hundred native crab seedlings; when they were four or five years old, I began at the south end of the row and grafted four or five trees each year. Within three years after they were grafted they blighted dead, till half the row which had been grafted was dead, while the other half that had not been grafted was as fresh as daisies. Then I grafted at the other end of the row and here and there a tree; they soon took the cue from the other grafted trees, and every one blighted. There are but few varieties of the apple tree that will live when trimmed in the early spring, when most horticulturists think grafting should be done.

I have one variety (called Hebron) and some seedlings that have lived and appear to thrive just as well with grafting as without. In one of these trees I have six varieties bearing, viz: Blushed Calville Seedling No. 1, Powers' Sweet, Okabena, Virginia and Wealthy. I also have bearing in a wild crab four varieties, viz: Whitney, Peerless, Virginia and Seedling No. 1. This tree stands near the public highway and attracts much attention and many expressions of wonder and amusement, that a tree can bear so many different kinds of apples. Allow me right here to express my wonder that such a miracle can be wrought by so small a piece of a tree as a graft—how it can produce an apple like the tree it was cut from and use the same life fluid that makes the unpalatable crab and not have one characteristic of the stock.

I have a number of trees grafted with several varieties each, which is quite an improvement, as these trees give fruit each year instead of every odd year.

My rule has always been to not graft or bud any tree that gives good fruit, and never graft a seedling until it shows what kind of fruit it will produce. As soon as a tree shows poor or undesirable fruit, I graft it with the best variety I have. In this way I have some seedling trees that are perfectly hardy, but gave small, undesirable fruit, filled almost every limb with desirable, salable fruit, which are larger and nicer than on the stock I bought. Some of these grafts bear so profusely that they have to be propped up to keep

them from breaking. These are the stock it pays to top-work. Budding is really grafting, and some prefer this way of getting the variety they wish on a certain stock, because it is done without so much cutting in the early spring.

There are many different views as to the season of the year that trimming should be done to injure the least. From many trials I prefer September. From the tenth to the first of October the blight is done for the season, and the roots have received their supply of the sap elaborated by the leaves, and the wounds where the limbs are cut off have a long season to dry and get ready for the next growing season. I have never heard of any grafting being done in September, but have often thought of it, and expect to try it next September. If there is any one here that has tried grafting in the fall and knows from experience that it is bound to be a failure, it may dissuade me from the trial.

The different ways of grafting and budding have been so often described and so minutely illustrated in various horticultural papers that it is useless for me to repeat them.

In conclusion, allow me to advise everybody to never cut a seedling, except for pruning it into shape, till it shows what kind of fruit it will bear; never trim off large limbs except the last of September or in October, and then, as soon as cut off, cover the wound with very soft grafting wax or paint; never expect somebody else will top-work your orchard to suit you as well as you can do it yourself; never top-work a tree that already bears good fruit; and never, no, never, expect to grow apples on a white birch.

BEST VARIETIES OF CURRANTS FOR THE AMATEUR.

J. R. CUMMINS, WASHBURN.

For home use, the White Grape currant possesses qualities that might place it first on the list. It yields about as much fruit as other varieties, and comes nearer to being a sweet currant than any other. It is not, however, profitable as a market variety, the red being more salable. The Victoria is a good bearer, and the fruit keeps well on the bushes for some time after being ripe. The North Star is the strongest grower of all varieties, a good bearer, clusters very large. The Red Dutch and Stewart's Seedling are also good varieties. Fay's Prolific is one of the profitable kinds where the conditions are favorable, but it cannot be recommended for general cultivation, not having the hardiness of other varieties. While the climate of this state is generally favorable, cultivation has very much to do with the profit of growing currants. Heavy manuring is needed, and ashes are useful.

Mr. Harris: I would like to ask Mr. Cummins if he has ever raised the Long Bunch Holland?

Mr. Cummins: Yes, that is a stronger grower than the North Star.

Mr. Elliot: Is there more money in it?

Mr. Harris: Yes, there is. It can hang on the bush until September. It does not bear the first three years as well as others, but after that it bears as well as any.

The President: Is it perfectly hardy?

Mr. Harris: It is perfectly hardy; it stands out in the western part of the state without any protection.

Mr. Wedge: I would like to ask Mr. Cummins if he has ever tried the Wilder currant?

Mr. Cummins: No, I have not.

Mr. Wedge: I remember a man at the Wisconsin meeting reported very favorably on the Wilder currant.

Mr. Hartwell, (Ill.): Mr. Stickney made more money out of the Long Bunch Holland than any other.

Mr. Richardson: I would like to ask the members what they think of the Stewart?

Mr. Cummins: I like it very well.

Mr. Frank Yahnke: Is the Long Bunch Holland better than the Fay's Prolific?

Mr. Harris: There is no comparison.

Mr. Yahnke: I mean the fruit.

Mr. Harris: Neither of them bear so much fruit.

Mr. Elliot: The question has been asked in regard to the Stewart Seedling, which was originated by Mr. Stewart, at Richfield. The Stewart is a strong grower, but it is not exactly what we would call hardy. Thus, some years its fruit buds will not be affected by the winter, and the next year it would be injured and there would be hardly a crop of Stewart Seedling, while the Victoria produced a good crop.

Some one suggested that there was not much difference between the Stewart and the Victoria in foliage and growth.

Mr. Harris: The habits of the bush are very different. The Victoria does not sprout at the roots.

Mr. Elliot: I think of the two the Victoria is the better.

Mr. C. W. Sampson: I have grown the Stewart for several years and also the Victoria, but found that the first year the fruit buds of the Stewart killed some. I have seen the Long Bunch Holland killed to the ground, so that the entire bush came off

Mr. Yahnke: I believe there is no currant that can beat the Red Dutch. The Red Dutch is hardy and by good cultivation can be made to yield as much as any other.

Mr. Busse: I have about five different varieties growing. I have 200 Stewart Seedling, 200 North Star and 200 Long Bunch

Holland. I find, as Mr. Elliot says, there is something that affects the Stewart Seedling, but it is one of the last currants in the market, and they are very salable. Two years ago I set out this new patch of Long Bunch Holland, 200, North Star, 200, and Stewart Seedling, 200, and 100 of the old variety of Red Dutch and some black currants. The year after I got quite a little crop from the Long Bunch Holland and the North Star, but the last year I found on the North Star a new complication; they bore too much. They were covered with fruit so I had to tie the bushes together, and they were loaded so heavily that some of the branches got down to the ground, and for a money crop they beat them all. For my part, so far as I can find out, there is more money in the North Star than in any other currant. I also had Fay's Prolific, but I dug them up and burned them. There is no money in them.

Mr. C. L. Smith: Before we leave this subject I want to say a word in regard to it, because our report is going to the farmers of the state, and they are interested as well as those who grow for market I want to endorse what my friend here has said about the Red Dutch, also, and the White Grape, which he tells me he uses in his own family and on his own table. If I were to give the very best of my judgment today, after thirty-three years' experience in Minnesota, if a farmer friend came to me and wanted my opinion as to planting two varieties of currants, I would say plant the White Grape and the Red Dutch. I know there is not so much money made by those who have bushels to sell, but for that very reason I would recommend them. I have the Red Dutch. They do not grow quite so large as the other kinds, and they do not sell so well on the market, but my folks ask me to bring home those little red currants; they say they make better jelly. I took some of those white currants and my girls mixed four boxes of black raspberries and twelve boxes of White Grape currants, and now the neighbors want just that mixture for jelly. I say for the amateur the Red Dutch and the White Grape are the best varieties of currants.

Mr. Hawkins: I am a farmer and I raise currants of the small varieties. My better half is the fruit half in our house, and she says it makes a difference in the fruit as to the amount of juice, and when I come in with the currants she wants those little red ones. We like the White Grape best and the Red Dutch is a close second.

Mr. Barnes, (Wis.): From the farmer's standpoint I think

I could sum up this whole thing by adding the Long Bunch Holland. I believe the farmer should have three varieties of currants, one early, one medium and one late, which he would have by adding the Long Bunch Holland, which is certainly hardy and productive, and it ought to be the third variety for every farmer to plant.

Mr. A. K. Bush: I would like to make this suggestion, that the committee that has the fruit list under consideration should make a list for family use, that is, recommending the best fruit for table and home use, and also another list for the commercial fruit grower. I think that would be a valuable thing, and the list could be cut in two before it is published.

Mr. D. T. Wheaton: I agree very much with what Mr. Barnes has said. I think the Red Dutch is the best to plant. I have the Stewart Seedling, the Victoria and the Fay's Prolific, and those do very well. I have another variety, I do not know what the name is; I obtained it from a fruit agent who traveled through the country. Those bushes are the most vigorous and the most prolific bearers I ever saw. The leaves are very bright; perhaps it is the Long Bunch Holland. The leaves hang on until very late, and the berries hang on until September.

Mr. Richardson: The fruit of the Long Bunch Holland is on the inside. You can hardly see any on the outside, but on opening the bush you find it is loaded on the inside.

WISCONSIN SEEDLING APPLES OF VALUE IN MINNESOTA.

A. J. PHILIPS, WEST SALEM, WIS.

Were I asked what Minnesota seedling apples were of value in Wisconsin, I could easily say Wealthy, but as there is so much of Minnesota that I am not familiar with as to soil and location, I will briefly give a description of a few of our best seedlings that have proved of value in many parts of our state, and leave you to judge of their value for Minnesota after trying them.

First. The Newell, or Orange, Winter. The seeds were planted on Section 13, Township 12, in Sauk county, fifty years ago. It is fine in quality, and as the old tree now stands in the town where it was planted it has proved itself to be hardy, but on rich soil it is not as productive as some others. On lighter soil it does better. This tree was planted by Orange Newell, and the seeds were brought from New York. It is a yellow apple.

Northwestern Greening, a winter seedling, that has been gaining friends very fast for the past ten years. Tree very hardy and, with

age, is productive. It is inclined to grow a very heavy top and needs much pruning when young. The seeds of this tree were planted by J. J. Hatch, in the town of Iola, Waupaca county, in the year 1849. The first scions were cut in 1873. It is doing well in parts of Iowa and Minnesota; is a fine, strong grower; bears very large green apples of fair quality, which keep well through the winter; by some it is thought to be the best winter apple for Wisconsin and similar latitudes. I visited the original tree in November, 1898.

The Avista is another winter seedling, and with me has been the most profitable winter apple I have ever raised, because it furnishes the apples and that every year. It furnished apples for the Centennial in 1876; also for the New Orleans Exposition and World's Fair in Chicago, and a peck from the old tree was taken to the Exposition at Omaha the present season. Season, December to March; very good in quality; fair size, and tree very hardy. The old tree has borne thirty-one consecutive crops. It was the only winter apple that bore for me the summers after the winters of '72-3 and '84-5, which were severe tests. If pruned much to force growth when young, it blights some, but if let alone is free from that disease. The seeds were brought from Vermont and planted near West Salem in 1858. It commenced bearing in 1868. John S. Harris thinks it a valuable winter apple for Minnesota. The old tree shows plenty of fruit buds for a crop next season.

The Eureka is another very hardy winter apple. It is a seedling of the Tallman Sweet and is sweet. It is of good size, and with age, on my soil, is productive. The trees of this variety produced the second largest number of bushels the present season in my orchard of winter apples.

The Wolf River is by far the largest and handsomest seedling apple that has been disseminated from Wisconsin. It figured prominently in eight or nine state exhibits at the Omaha Exposition. It was generally scattered over the northern states from the New Orleans Exposition, where it took in all twenty-five dollars in cash premiums, more than any other one variety. It is hardy and, with age, quite productive. The seeds were planted in 1849, in Waupaca county, Wis., by Wm. A. Springer, whose likeness was the frontispiece of our annual report in 1897; he claimed it grew from seeds of the Alexander, which it resembles very much, but it is not inclined to blight.

The McMahon is a late fall apple and among the hardiest and handsomest seedling apples Wisconsin has produced. It is also claimed that this tree grew from seeds of the Alexander, which it resembles only in size, being of a white color. It is fair in quality and like all I have named bears heavier as it grows older. It is not a first-class shipper, as the skin is tender, and it shows bruises very quickly. This tree is doing well in many places in Minnesota, where it has been bearing for many years. These seeds were planted about 1860, and first scions cut in 1871.

The present season I have found a very handsome red seedling apple. In shape it resembles the old Bellflower. It has borne three consecutive summers and is full of fruit buds for next year. In season it is late fall. I have no doubt of its productiveness, and

if, as it promises, it proves hardy, it will be of commercial value, as the quality is good and appearance attractive.

I have seen over two hundred and fifty Wisconsin seedling apple trees, have tried at least one-third of them, and have boiled the list down to the few of those that I consider of the most value for me on my high limestone ridge location—on lower lands they would not prove as good. We are testing quite a number at Wausau, and if we find any that are of more value for the north we will report later on. You will notice this list contains four winter varieties and three fall varieties. With me the value is in winter varieties. So much is being written on new and hardy varieties that it gets to be an old story, and I find that the best thing I can do for a planter who desires information is to induce him to visit me and examine my trees and apples in the bearing season. I have many that I am testing both on their own roots and top-grafted, and I may be able to report a more valuable list later on—and shall work while I live to capture the thousand dollars offered by the Minnesota State Society, but as the tree is to be so near perfection I do not expect to get it.

SELECTION OF VARIETIES FOR THE VEGETABLE GARDEN.

J. E. NORTHRUP, MINNEAPOLIS.

When I came to examine the subject that had been assigned me I dicovered it was a very large subject to do justice to within the limits of five minutes. I often regret there is not some guide for people who are anxious to plant the best varieties of seed it is possible to get. I believe that thought has occurred to almost every one who has searched the bewildering mazes of a seed catalogue.

Each variety of vegetable should possess distinguishing points of excellence over others, before it is entitled to a place in the list of varieties.

A study of varieties well repays not only the market gardener but the amateur, who plants for his own use and wants the best that can be grown.

It does not follow that a variety that is most profitable for the trucker is best for the private planter. The former plants for profit only, while with the latter quality should be the prominent consideration. I have known a shipment of 1,000 boxes of peas, sent to New York state by a southern trucker, to sell for $1,000 more than a like consignment equally good received there two days later. It was earliness that won the prize; quality cut no figure.

I once sent to Henry Ward Beecher—who was an enthusiastic gardener—a small quantity of seed of a new, extra early pea which I had assisted in developing, and which afterwards won and sustained for years the reputation of being the earliest pea known (the "Alaska"), and asked him to try them. In due time I received a letter from him, saying that he had planted the peas and they were

very early, but said he, "They were not sweet, and to me a pea without sweetness is like a sweet potato without the sweet." In this he was entirely right, and yet thousands of private planters use the "Alaska" pea, when if they but knew of and would buy the "Alpha," which is but three or four days later and which is a much older variety, they would have a pea of infinitely finer flavor.

In late peas, a great favorite is the Telephone, and it is popular not only with the market gardener but with the consumer. It is liked by the former because it has a very large pod, and a bushel basket is quickly filled. It is favored by the consumer because it is sweet and of delicate flavor, and yet how many American housewives know that a half bushel of Telephone peas, for which they pay a high price because they are Telephones, does not yield as many shelled peas as a peck of "Prince of Wales," which is equally desirable, if not of better table quality.

It is to be greatly regretted that private planters or purchasers of vegetables on the market should not be better posted as to the comparative merits of the different varieties, and that they are not more correctly informed is largely the fault of those seedsmen who use their catalogues as a means of humbugging their patrons instead of educating them along correct lines.

If the U. S. Government would devote one-fourth the amount of money now annually expended in the distribution of ancient varieties of seeds towards establishing under competent supervision trial grounds in which all alleged new varieties should be tested and proved before it was allowed to offer them for sale, and to permit no seed catalogue to contain any other than official descriptions of varieties, a genuine service would be rendered, not only to seed purchasers but to that class of seedsmen who seek to appeal to the common sense instead of the imagination of their customers.

PREPARATION FOR ORCHARD PLANTING.

E. COOPER, ADRIAN.

In preparing ground for orchard planting, I would either summer fallow it the year previous to planting the orchard or plant it to some cultivated crop, such as corn or potatoes. I would let no foul weeds or grass go to seed on the ground. Keep the ground thoroughly cultivated to insure moisture, and plow the following spring, and follow the plow with a subsoiler to well break up the ground deeply, thus giving a good chance for the growing trees to root deep, and also for the ground to hold and contribute moisture for them.

The ground should be thoroughly harrowed and kept mellow the first year after planting.

I do not think it advisable to plant any crop the first year in a newly planted orchard in our locality, as one can attend to an orchard and keep it in much better condition if there is nothing planted in between the rows of trees.

THE MINNETONKA FRUIT GROWERS' ASSOCIATION.

ROLLA STUBBS, HULDA, MINN.

Thinking that it might be of interest to your many readers to know of the success of our association I will submit a brief account. Less than two years ago, a few of us met together to see what we could do in organizing a fruit growers' association. We were about two months, meeting two times a month, getting the constitution and by-laws perfected, and when we did get it in shape it was too late to put our general manager on the road to take orders (this was for the year 1897); but we made the effort, and it was a success, as we sold eight thousand dollars worth of small fruits at a cost of seven cents per case for expenses.

Previous to organizing, the members often shipped too many berries to the same market, making a low price before they could get them off their hands.

The year 1898 we reorganized with a better constitution and by-laws, and we are now incorporated under the laws of the state. With the experience of the year 1897, we saw many places where we could save on our general expenses, and many other ways of advantage to the association. The year 1898 proved to be very favorable for our berry crop, not so much rain as the previous year and the fields averaged very good crops. That year we marketed through the association ten thousand five hundred dollars worth of small fruits, mostly red raspberries, at a cost of four cts. per case. In the vicinity of Long Lake there are nearly 200 acres of small fruit in bearing, with an increase of from twenty-five to thirty acres of young plants to come into bearing next year, and most of this fruit will be handled by the Minnetonka Fruit Growers' Association.

The largest number of crates shipped in one day was 800 (if am I not mistaken). The largest number of orders received in one day was from seventy-five different firms.

The majority of raspberries raised here are the Marlboro for red, and for black the Gregg and Nemaha. There are being planted large pieces of the Loudon raspberry, as they are very prolific, and we think will do well without covering, as they have withstood the open winters two years without killing back scarcely a bud. Our land is gently rolling with a good clay subsoil. In some places the clay comes close to the surface.

After twenty years of raising small fruits and studying the soils, many of us older settlers are learning how to propagate to the best advantage.

If there are any questions any one would like to ask in regard to the working order of the association I will be pleased to answer.

Officers of Minnetonka Fruit Growers' Association for 1898 are:

MILO STUBBS, President.

ROLLA STUBBS, Secretary.

THOMAS TALBOT, Treasurer.

Board of Directors.—JOSEPH ——; THOMAS REDPATH; HENRY MATHER.

SELECTING, PRESERVING AND PLANTING SEEDS FOR GROWING APPLE SEEDLINGS.

R. H. BUTTERMORE, LAKE CITY.

Respecting the above topic, I would state first, that my experience is somewhat limited in comparison with that of those extensive nurserymen who plant *apple seeds by the bushel.* Apple seeds should be selected from *hardy apples* that were grown in Minnesota or in other northern states; otherwise my observation is that the seedlings will be delicate and subject to blight, too tender for root-grafts or grafting upon. I have planted seeds from apples that had been grown down east, and when up some of them blighted, and the next winter terminated the existence of most of them. The practice of planting them, I believe is *the chief reason* that we have so much blight and so many unmatured trees in the late fall, causing "black-heart" and other fatal diseases.

It is not bushels of seeds that we should plant (because we get them easily in eastern states) and get them to grow long enough to sell for dollars and cents—but *our aim should be to persevere* in the best known means to secure *hardy*, delightful fruit.

I have noticed a great many sprouts coming up in the spring around the trunk, of some of my apple trees, evidently from the grafted stock, and before the next fall they would all be blighted to the ground. The same occurs every year; it seems to me that the original stock were from eastern grown seeds.

About preserving apple seeds for planting the next spring. Some have adopted different modes. Some think it better to put them in damp dirt in a cool cellar; others store them in the house; others put them in the ground when they are fresh and use care not to let them dry before or after planting. I believe the last plan is the best. The most successful mode of preserving apple seeds is of great importance, and I would suggest that Prof. S. B. Green would please give us his experience on the above topic.

As for planting apple seeds I believe there is no mystery about it. As I stated before, I have not had the experience that others have had. The most satisfactory way, it seems to me, is to put them in the ground as soon as it will work well in spring. Plant them three-fourths of an inch deep, in rows about three feet apart and thick enough in the row so that if some of them fail they may be still thick enough. In dry weather they should be moistened with lukewarm water by pouring it in a little trench about half a foot from the seed drill. It should be done after sunset.

I would submit the whole subject to the "Question Box," as it is one of great interest to apple raisers.

THE WESTERN HORTICULTURAL SOCIETY, WINNIPEG.—This vigorous young association held its annual meeting February 10. We note that the name of Wyman Elliot appears on their program. Personal intercourse with the officers of the society gives assurance of the faith they have in growing fruit in their country, with its rigorous climate. The Minnesota society draws a number of members from that section.—SEC'Y.

REPORT OF TOWN AND VILLAGE IMPROVEMENT COMMITTEE.

LOU ALICE GALE, CHAIRMAN.

(Made to State Federation of Women's Clubs.)

It has been impossible for the Town and Village Improvement Committee to meet together. But each member has done as much as she could in our district.

We had 300 "Do and Don't" placards printed and have 150 on hand for use next year. Placards were sent to Wabasha, Benson, Tracy St. Anthony Park, Buffalo, Milwaukee, Wis.; Forman, N. D.; Milner N. D.; Citronelle, Ala.; Boise, Idaho.

There were 300 circular letters printed and one sent to every club in the federation.

The ladies of Morris have been very much interested in this work. They have succeeded in getting waterworks in their town; have been improving the cemetery all summer; have tried to interest people in keeping the weeds out of their yards. They succeeded in having an unusual number of trees set out in the spring, and planted ivies, furnished by Mrs. Ohlberg, of Albert Lea, around school buildings and churches.

In Albert Lea, they have organized an improvement league that is doing good work. Mrs. Ohlberg will gladly send ivy slips to any one who will send for them.

The Town and Country Club of Northfield has, first, given five dollars to the Northfield Improvement Association; second, this club, in connection with other federated clubs of Northfield, gave an "Author Social" at which fifteen dollars were raised for the Improvement Association—this money to be donated to placing waste boxes at different street corners; third, it has encouraged the planting of flower seeds, and neatness in general by talks to the school children and the giving away of seeds; fourth, in connection with other clubs, it has kept before the public the benefit and pleasure of having ugly places made beauty spots.

The park by the Milwaukee depot is the result of women's work in this direction. The poles about the city have been painted.

The Monday Club of Northfield has also raised money for this work; made addresses at public schools on Arbor Day and has helped in printing "Do or Don't" placards.

Sorosis, of St. Peter, has succeeded in getting one fine drinking fountain for horses and dogs put in their town and hope to have more fountains put in soon.

The Women's Reading Club, of Stillwater, has identified itself in the movement to establish a free library, and has planted woodbine around public buildings.

The club in Sleepy Eye has put in a public fountain for man and beast.

In Sauk Center, the ladies tried to interest the children in beautifying the school grounds. They distributed seeds among the school children in the spring. These were to be planted at their homes, and in the fall they had an exhibition Saturday morning at the school-house. Recitations and singing constituted the program.

After this, light refreshments were served. The children were so interested in this that they hope next year to have a flower show.

In Tracy the club members planted a tree in the city park on Arbor Day.

The "Do and Don't" cards were placed in the school rooms at Marshall.

In Litchfield, the club placed the "Do and Don't" cards in their schools and entered a protest in the city council against hitching posts on the business streets of the city.

The club at Merriam Park had a "Town and Village Improvement Committee" appointed; also a committee for the protection of the song birds. They have succeeded in interesting the teachers and pupils in this work.

I received the following report from the Clio Club, of Hastings:

"Last spring the club laid out a park under the spiral approach to the bridge over the Mississippi river, and has taken care of the same during the season. The city shared in the expense, but the letting of all contracts and superintendence of all the work was done by the Clio Club. The park is a gem and has been much frequented all summer. The club also distributed to the children of the public schools several hundred packages of flower seeds."

In St. Cloud, our club has taken up this work for the first time We succeeded in getting a garbage wagon started to collect the garbage from the houses twice a week. In the spring, we tried to get the children interested in cleaning up the streets and vacant lots. Superintendent Parr, of the public schools, and president Klieber, of the Normal School, gave the pupils a half holiday for this work. They were assisted by the teachers and members of the Reading Room Society. We divided the town into sections and gathered the rubbish into piles; these piles were carried away by the street commissioner. There was a good deal in the newspapers about the work, and every one in town seemed to take an interest in his own grounds.

During the street fair in October the Women's Club fitted up a rest room for the farm women. It was a great success and accommodated 400 women and children during the four days of the fair. This year we hope to make this rest room a permanent thing.

The clubs all over the state seem to be much interested in their work. The newspapers all over the state have given a good deal of space this year to the improvement work, and I hope next year the small towns will be greatly benefited.

Our circular letter will be distributed and will give you some idea of what can be done in this line.

HEADS NEED THINNING.—The chief defect in many orchards is too much wood. The heads are so dense that light and air cannot get to the interior. As a result the fruit is borne upon the ends of the outer branches, the yield is reduced, and the quality inferior. Do not prune severely but cut out interfering branches, so that all parts of the tree can get air and sunlight.

SEEDLING FRUITS FOR 1898.

J. S. HARRIS, LA CRESCENT.

The year 1898 has given us a bountiful crop of Minnesota seedling apples. Not only have those noted by your committee in previous years fruited liberally and fully maintained the estimate of value placed upon them, but hundreds of others have fruited for the first time or been first brought into notice during the year. It is not expected that after given a thorough trial, more than one in a hundred of them will possess such merits of hardiness of tree and size, quality and appearance, as will give them a permanent place in our pomology, and it is hardly expected that the ideal apple we so much desire and fondly hope for, a perfectly hardy tree, a profuse annual bearer, bearing a fruit of perfect form and bright delicate color, juicy as if filled with new wine, of rich sub-acid flavor, possessing the good points of the Jonathan, Porter, Swaar, Seek-no-further, Nonesuch and Pearmain, a long keeper and weighing from six to ten ounces, has yet been originated, but it is the opinion of your committee that we are making good progress in that direction, and that it will surely come.

I have not this year made a general survey of the state for the purpose of examining trees of varieties heretofore noted or in search of new varieties, partly for the reason the last few winters had been unusually mild, rendering it difficult to estimate the hardiness of trees that have been grown and are beginning to fruit since the winter of 1884-'85. I had intended to visit the orchards of D. F. Akin and others at Farmington, and the trees of Mr. Siebenaler and Gen. Le Duc, at Hastings, before this meeting, but have been unable to do so. I have looked over the tree station at Owatonna and the orchard of Thomas Lightly at Oakland. The Lightly orchard contains about sixty varieties. They were very generally bearing a heavy crop, and a considerable number of the varieties were of fine appearance and fair quality, and showed characteristics that pointed to Wealthy parentage.

The seedling orchards in the town of Sheldon, Houston county, were visited. A number of the trees there are from sixteen to thirty years old. They were bearing very heavy crops, and the trees were looking well. The fruit of several varieties was of very fine quality. If they should survive the next test winter, we may expect some treasures from them. The Okabena, Peerless, Catherine, Oxford's Orange, of Minnesota, and Morgan's Seedling, Avista, Northwestern Greening and Wolf River, of Wisconsin, and others of the older seedlings are doing well at the present time.

A considerable number of samples have been sent me for examination and an opinion of their merit. So far this season I have examined, made outlines and recorded descriptions of about forty varieties, a few of which I will present at this time.

The "Milwaukee" is a Wisconsin seedling of the Duchess, by Geo. Jeffries, of Milwaukee, that is reported as doing well, and I think it is worthy of a trial in this state. *Description:* size, 7 to 8; weight, 8 to 9½ ounces; form, round oblate, slightly angular; color, greenish

yellow and red striped; stem, short; cavity, broad, deep, funnel shaped, slightly russetted at bottom; calyx, open; basin, large, deep and nearly smooth; core, small and closed; flesh, yellowish white, tender and juicy; flavor, pleasant acid, good; season, early winter.

Albee Sweet. Size, 5; weight, 5 ounces; form, round conical; color, light green, changing to yellowish, with a brown or dull red cheek and obscurely specked with small whitish dots; stem, short medium; cavity, narrow, medium, slightly russetted at bottom; calyx, closed; basin, small, shallow and wrinkled; flesh, fine, firm, yellowish white; flavor, clear sweet. The tree is about the only survivor of a large lot of seedlings planted from thirty-five to forty years ago, and is not known to have been injured by hard winters. Origin, Portland, Houston county.

Adaline, by Jacob Klein, Hokah. Size, 5; weight, 5 ounces; form, smooth, roundish; color, greenish yellow ground nearly covered with deep red and overspread with many small russet dots; stalk, short, medium, in a medium broad, rather deep, russetted cavity; calyx, closed in a deep, abrupt, bowl-shaped basin; core, small and closed; flesh, fine and white; flavor, mild subacid, good; season, late autumn and early winter; was awarded second premium at late state fair.

Sweet Allie, by Jacob Klein, Hokah, Minn. Size, 7; weight, 8 ounces; form, round ovate, inclining to conical; color, light yellow ground, nearly covered with red in marbling and stripes; stem, short, in a regular, medium deep cavity; calyx, closed; basin, medium regular, smooth; flesh, nearly fine, greenish yellow; flavor, sweet; tree, vigorous and good bearer on alternate years; origin, from seed from Canada; season, early September.

Hathaway Seedling, from R. Hathaway, Faribault. Size, 3; weight, 4 ounces; form, smooth, round; color, greenish yellow striped with red on the sun side and quite thickly sprinkled over with minute brown dots, obscure on colored portions; stalk, long and slender, set in a rather above medium broad and deep cavity; calyx, small and closed; basin, medium, ribbed; flesh, yellow, fine grained, firm; flavor, mild acid. The originator says of it: "Excellent for cooking, fair for eating and keeps well till April." Tree about twenty years old, has fruited twelve years. Tree believed to be perfectly hardy and is free from fire blight.

Akin's Russet, Seedling No. 71, by D. F. Akin, Farmington. Size, 5; weight, 6 ounces; form, oblate; color, yellow, mostly covered with light russet; stem, short, in a regular medium cavity; calyx, closed, in a broad medium basin; flesh, yellow, fine, tender; flavor, subacid, good; season, November.

This report is already too long, therefore the most desirable of the remainder will be reported upon later and appear in the magazine during the season. The work of this committee should be continued. It takes up considerable time and involves some expense, but it is deeply interesting and may prove of great importance to pomology.

Secretary's Corner.

WANTED, NOVEMBER 1898 "HORTICULTURISTS."—If *you* have one to spare, please mail it to the secretary. A few are needed very much; if more are sent they can be used to the best advantage.

COL. STEVENS IMPROVING.—We all rejoice in the improvement in health of our old and esteemed fellow-member. The crisis in his disease is past, and he is steadily gaining strength, and we may hope to see him out again as spring opens.

A FORESTRY MAP FOR MINNESOTA.—H. B. Ayres, of Carlton, Minn., has been authorized to prepare a map of the forest regions of the state. This is a very important matter, especially as it emphasizes the increased interest manifested by the national government in the forest reserve movement, which is also rapidly deepening in our own state.

DELAY IN SENDING OUT 1898 REPORT.—The indulgence of our members has been called into play in the delay in this matter. The printers were unable to get them out as early as we would liked, and there is still a shortage, which it is hoped may not be for long. It is a *good* book when it comes. Meantime you may give away the 1898 magazines, as it is sure to reach you soon.

LUGGER'S REPORT ON INSECTS INJURIOUS TO FRUITS.—Prof. Otto Lugger, entomologist at the State Experiment Station, has just published what seems to the writer a very full and comprehensive report on a subject of great interest to horticulturists, "Insects Injurious to Fruit Producing Plants," but the professor says, however, there is more to follow. The book, for it is worthy this name, contains some 350 pages and is profusely illustrated with cuts and halftone plates. With its aid every fruit grower should be able to know and discipline his own bugs at will. A copy can be had free on application to the State Experiment Station, at St. Anthony Park.

OUR PRINTING APPROPRIATION BILL.—The bill now before the legislature, for the purpose of providing for the printing of the society, increases the number of bound volumes by one thousand, with the purpose of using the additional number in the public school libraries of the state. There are many more than this number of such libraries in the state, but it is not thought probable that more than this will apply for them. There is still an opportunity to communicate with your representatives in the legislature as to this bill, which is fraught with so much importance to the society, and if you have not already done so, please look upon it as a privilege, and do so at once.

THE FOREST RESERVE LAW.—A bill almost identical with that presented to the legislature two years since on this subject, and

published in our monthly at that time, is again before that body, and with a reasonable probability of its passage. There is a growing interest in the subject of forest preservation and reproduction, which is full of hope for the great pine forests of our state. A movement is making also to secure a large pine reserve at Itasca lake, and the fire-warden's law is receiving attention. A bill for the usual appropriation for the state forestry association is also pending. If *you* are interested in any of these things, which are all of such importance to Minnesota, you may exercise the prerogative of every American citizen and "interview" the delegation from your district thereto. The true legislator wants what his constituents want, if he can find this out.

REGULATION OF THE INTRODUCTION AND SALE OF NURSERY STOCK.—The bill for this purpose, the preparation which was provided for at the last annual meeting of the society, has been put in shape, and was some days since introduced. We have not yet seen a copy of the completed bill, but know that much pains has been taken in its preparation to guard properly all the interests at stake. With similar laws in reference to the San José scale, etc., in so many of the states, there is an apparent necessity of our state adopting some such legislation. Should the law in its operation prove to bear injuriously in any direction, it will be an easy matter at any subsequent session to secure its amendment. Canada has a very drastic law on this subject which entirely excludes nursery stock shipped from the United State. The fruit growers of Manitoba are trying to secure a modification of it which will admit stock from Minnesota. Their chances of success will be very much greater if our state makes provision for the inspection of its nurseries, as the proposed law does.

The bill as drawn permits the shipment of nursery stock from any state in the union or Canada, provided the nursery from which it comes has been duly inspected and found apparently free from San José scale or other injurious insects and diseases. It also requires the same kind of inspection for nurseries in the state. Small fruit growers who sell plants at home and do not ship, are exempted from this inspection. It requires a bond of $1,000 from nurserymen and dealers who solicit orders on the road, as surety that they will comply with the provisions of the act, the bond to be given either by private individuals or an indemnity company. It shuts no nurserymen nor dealer nor any inspected nursery stock out of the state, but throws such safeguards around the business as to give a reasonable degree of protection to planters. The argument against the measure, that in spite of inspection this dangerous insect may slip in, is one that may be employed with equal force in reference to the efforts to exclude small-pox or cholera. In spite of the imperfectness of such inspections they are found very useful, and in large measure subserve the purposes designed. We hope for much good from the operations of this measure, should it become a law. Copies of the bill can be secured later from members of the legislature, as it will soon be in print there without doubt.

J. C. Plumb

LATE OF MILTON, WIS.

(For obituary see page 153.)

THE MINNESOTA HORTICULTURIST.

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THE MALINDA APPLE.

A. K. BUSH, DOVER.

As much inquiry comes to me about this apple, I will answer al through the Minnesota Horticulturist.

I was fortunate in securing twelve trees of this variety from Mr. Kneeland, of Wabasha county, about twenty-one years ago. These were planted on a steep hill-side which slopes to the east, sheltered on the west with native oaks; on the north with a grove of willows, maples, etc., on the south by a white pine hedge, which also shelters my barns, feeding yards, etc., from the north winds and drifting snows. The location and soil are favorable, the protection ideal. This orchard, when planted, contained about seventy-five trees, including Duchess, Wealthy, Early Harvest and several varieties of crabs.

Ten of the Malinda are standing in excellent condition for trees of their age, a larger proportion than of any other variety. These ten are annual bearers—wonderfully productive every other year. Two years ago we picked and measured seventy-five bushels of apples; this year the crop was fully 100 bushels. From one tree, separated by quite a distance from all others, we gathered enough to fill six apple barrels, as many as would stand in an ordinary wagon box.

My neighbor, Mr. Wm. Somerville, the venerable horticulturist, who lives three miles west of my farm, reports one crop of twenty-five bushels of Malinda apples grown on one tree which was top-worked on a Transcendent stock about thirty years ago. Mr. G. Leitz, a neighbor who joins my farm on the north, has several Malinda trees, from the Jewell Nursery Company, I believe. These are fully as productive and healthy as mine. I might refer to others who are growing this apple near my orchard with success. The tree does much the best top-worked on some hardy, thrifty stock like the Hybernal, Virginia or Peerless. It also comes into bearing much earlier. Mr. Somerville called my attention to a top-worked Malinda which was well loaded with fruit three years from the graft.

With us, in Olmstead county, the tree is regarded more hardy and productive than the Wealthy when it comes into bearing, which is always very late on its own stock, say ten to twelve years after planting

The fruit will keep through the winter if proper care is used in picking, handling and storing. This I have demonstrated several seasons.

Now, about the quality of the fruit. We do not claim it is equal to the Duchess as a cooker or the Wealthy as a dessert apple, but it is superior to much of the southern fruit, which costs about $3.50 per barrel this year—and "out of sight" when compared with no apples. My children and those of our neighborhood are not such critical judges of apples as our fruit committees. When my boys come from the cellar with pockets filled and a choice, red-cheeked Malinda apple in each hand, and I ask them if they are good, they reply, "you are just right, good enough for us."

After serving Malinda apples, baked in one of those old fashioned stone bean pots, I ask my company how *they* like the fruit. "Oh, it is delicious! Where do you get such nice baking apples?" We grow them. I am making no attempt to boom the Malinda, have no stock or fruit to sell. In fact, trees, true to name, are very scarce.

I would advise top-working this variety, as well as all other half-hardy sorts, on some hardy stocks you may have in the orchard.

We need more home-grown, long-keeping apples on our Minnesota farms. Why not try the Malinda with other promising varieties, like the Repka Malenka, Cross 413, etc.

PLANTING THE BLACKCAP RASPBERRY.

DEWAIN COOK, WINDOM.

Owing to the ravages of that dread disease, anthracnose, I have quit growing the blackcap raspberry for market, growing only a few for experimental purposes and, consequently, have little enthusiasm to put into the subject.

On the windy prairie it will not do to plant them on any piece of land that we happen to have handy; they must have protection from the winds. I believe it were better not to plant them at all than to put them where the wind has full sweep.

First, a piece of land is supposed to be ready in a sheltered locality and marked out in rows one way eight feet apart. If the plants have come from a distance, early planting is best, and from three to four feet in the row I think about right. If cut worms are very thick, I believe the plants should be set still nearer in the row. Care must be taken to have the roots set as deep as possible so the plant will not dry out before growth begins, and always press the earth firmly about the roots, yet leaving only a light covering over the crown.

If we are growing our own plants I think it best to defer planting until the plants have made from two to six inches growth; then have the land freshly prepared and take out a shovelful of earth at every place a plant is to be set. Then, dig the plants as they are wanted to be used, taking pains to leave all of the earth possible attached to the roots, and carry them in baskets or otherwise to where they are wanted and set a plant in each of the holes that has been dug. This way the plants may be set deeper, as there is little danger of smothering them, and there is greater certainty of getting a full stand than by the way of planting before growth begins.

There are other and, perhaps, better ways of setting the blackcap raspberry, but unless the conditions are very favorable it will not be good policy to plant largely of them.

DISCUSSION.

Mr. Hartwell (Illinois): I find the gentleman's experience is similar to mine, and yet he gets scared if the anthracnose gets after him once in a while. We are troubled some with anthracnose, but some years we have very little of it. As to setting the plants, I have found it a good practice to make a trench a little deeper than I want to set the plants.

Mr. Wheaton: What is the general reason that the blackcap fails to fill up as it should?

Mr. Elmer Reeves (Iowa): I think the case is, as has been suggested in one of the papers, the lack of pollenization.

Mr. Bunnell: Which are the best varieties?

Mr. Hartwell: The Older; the Kansas is a good variety also.

Prof. Green: Do you like the Older as a market berry?

Mr. Hartwell: Yes, I do.

Prof. Green: Is it not a little soft?

Mr. Hartwell: One of my pickers found six quarts on Thursday that had been picked sometime and overlooked; I sent them to market with the rest, and no one could tell the difference. I lost two crops by frost. The Older is the least subject to anthracose.

Mr. Wedge: As a profitable market berry, it should be more generally appreciated; it is a berry of good quality and one of the best home berries that can be grown. I have had it on my place for years. Mr. Elmer Reeves is the man who persuaded me to plant the Older. We also have the Gregg, the Nemaha and most of the other blackcaps, but the Older is doing much better than any other variety. For the home market it is excellent.

Mr. Reeves: I never feel like apologizing for pushing that raspberry. I received samples from parties who claimed to have originated that berry, and the point of it was I found I was furnishing them their stock of plants to introduce them. That variety has one weak point, and that is its liability to injury by frost late in the spring. It is the best blackcap for home use I know anything about. For market it is as good as any variety, provided you pick it close. You must pick them oftener and not let them get over-ripe, and they will take better in the market than the Gregg and other varieties, on account of their better quality. I consider it the best and most profitable variety of all our blackcaps.

Mr. C. W. Sampson: I would like to ask whether the Older is perfectly hardy?

Mr. Reeves: I do not lay any raspberries down. It is the most hardy I know of.

Mr. L. R. Moyer: I do not want anybody to get the impression from Mr. Cook's paper that it is not worth while planting raspberries on the prairie. We have better success with raspberries than with any other fruit. The first we have in the spring is the Palmer, then the Souhegan. The Palmer is quite a bit earlier, a week or ten days earlier, than the Gregg or Nemaha, but I do not like the Nemaha as well as the Gregg. It seems to be more woody. I have been very much encouraged with blackcaps. We have given up trying to raise strawberries, but we succeed well with blackcaps. I have grown them for fifteen to twenty years.

Mr. Richardson: In our country it seems to do well on all sorts of soil. It responds readily to good care and cultivation and seems to do well on any soil.

Mr. Bush: The thought was brought out here that the blackcap was better appreciated in the country than any other variety. It does splendidly on every kind of soil. I have disposed of my crop for the last two or three years right among my neighbors. One of my neighbors has picked my fruit on shares, furnishing his own boxes, and we have never succeeded in raising as many blackcaps as our neighbors wanted.

Mr. Bunnell: How does the price compare with the red?

Mr. Bush: I get more for them than for the red—fully as much anyway.

Mr. Bunnell: I find in the market at St. Paul the price is not as high as for the red ones.

Mr. Yahnke: In our market I always get two cents less for the black than for the red, and I do not see how any one can afford to lay down raspberries and come out even.

Mr. C. L. Smith: And I do not see how anybody can afford to raise black raspberries and not cover them and come out even.

Mr. Philips (Wisconsin): The best black raspberry I have I do not know what it is. I stopped off at Worthington once to see the old Okabena tree. I found Mr. Ludlow, and after looking at the tree I found he had a peculiar black raspberry, a very nice berry. It was in the latter part of June, and he was selling them for twenty-five cents a quart, all he could pick, and I found they were marketing those berries seven days earlier than they were marketing the first ones at Sparta. He was selling them seven days before Thayer commenced selling his first berries. I had him send me a dozen plants. They need no care; they have never been laid down; they grow from the tips, and they always give me a good crop. He had no name for them.

Mr. Reeves (Iowa): There is a black raspberry in that country that is native.

Mr. C. L. Smith: The best I could find out about that raspberry was that twenty-six or twenty-seven years ago there was a lot of Doolittles planted there; the birds carried the seeds into the grove, and out of those seedlings came that black raspberry.

Mr. E. G. E. Reel: I would like to know what it costs to plant an acre of black raspberries.

The President: I would say it would cost about forty dollars an acre.

Mr. Hartwell (Illinois): The conditions are so different here from what they are where I am. For one thing it depends upon what your land is worth. I paid $125 an acre for the land I planted. It is pretty difficult to give a close estimate, but I think I could plant an acre of raspberries with my own plants for five dollars. Cultivation is another thing I would put in the value. I would not count the first year's crop, although it might pay rental on the ground. I cultivate with the Breed weeder. I suppose you all know what that means. It is simply one of those big hay rakes, and I can kill an acre of weeds in an hour. There are many other things that enter into the estimate that I cannot discuss in detail. I had potatoes, sweet corn, etc., on the ground.

Prof. Robertson: Did you ever put field corn in?

Mr. Hartwell: Well, I have done it. I set my berry plants three feet apart in the row and the rows eight feet apart, about 1400 to the acre. I question whether there is a profit in growing a crop between.

Prof. Robertson: I tried it this year, and I do not know that it is profitable.

Mr. Philips (Wisconsin): The most extensive growers of raspberries in Wisconsin are Coe & Converse, of Ft. Atkinson. They plant them so they can cultivate both ways through the season, and after picking they run the plow through both ways, and they cultivate quickly and successfully.

Mr. Hartwell: On sandy soil the Breed weeder will do very nice work.

Mr. C. L. Smith: About a crop to grow between: I have tried almost everything, and I have found the easiest of cultivation and the most satisfactory I have used is beans. I put two rows of beans between each row of raspberries and a hill of beans between each two hills of raspberries. The beans paid for the cultivation the first year, so only the value of the ground, the planting and plants are figured in, although the cost for planting is rather more than Mr. Hartwell represents. I practice laying down and covering, and I have made estimates in this society. I thought it might be done for $6.00 an acre, but I think this year and last it cost about $10.00. I think it would cost at least $16.00 to get them through to the second year. You do well to get berries the second year and pay for the cultivation and lay them down for $30.00.

Mr. T. T. Smith: How far apart do you plant your black raspberries?

Mr. C. L. Smith: I make the hills three feet and the rows eight feet.

Mr. R. H. L. Jewett: I would like to endorse what Mr. Smith says in reference to a crop between raspberries. Beans are the crop I would recommend above all others, as the ground can always be kept clean. We use the "Success" weeder, which I think is superior to anything else we have; we have no trouble at all in keeping the weeds down. We have a variety of beans that as soon as the pods get full the leaves drop off, so there is no shade on the ground. I think it is the best way to cultivate raspberries.

PLANTING AND GROWING CURRANTS BY THE MARKET GARDENER.

FRANK YAHNKE, WINONA.

The greatest obstacle for the market gardener in planting currants is, that he has to wait three years before he receives any returns from his valuable land. This can be always avoided by the right way of planting them.

The piece of land the market gardener would like to plant his currants on must be prepared carefully in the fall, and the currants must be planted early in the spring. The rows ought to be eight feet apart and the plants five apart in the row. This distance is the most convenient for cultivating and spraying them, also in hauling manure between them.

Before planting, the ground must be marked out both ways, then heel in the plants in different places so that they are convenient at any time for planting. Then with a spade lift up the ground where the plant is to stand and set it in; let the ground fall back upon the roots and step on it, so as to press the soil onto the roots. By a little practice the planting can be done rapidly.

After planting, the ground must be smoothed off with a fine one-horse harrow. Then some early vegetables, as carrots, beets or radishes, can be sown between them. As this crop has to be kept clean, the currants need no extra care, and very little land is wasted.

In the spring of the second year, the ground between the rows must be plowed and smoothed with a cultivator and harrow. Then a crop of beans or dwarf peas can be raised between them.

After the second year, the ground ought to be left to the currants. Every spring the ground between the wide rows must be plowed and leveled with a fine-tooth cultivator and kept cultivated both ways until July, or as long as weeds appear, but not later than the middle of August. Every two to three years a good coat of barnyard manure must be applied to the currants. The best time to apply the manure is in the fall; then plow it under in the spring.

Currants grow in almost any kind of soil, but the soil best adapted is the sandy loam.

It is generally thought that currants need little care, so most farmers raise their currants in fence corners and so obtain poor fruit. Therefore, the market gardener must give his currants the best cultivation possible.

To make currant raising profitable, obtain first-class fruits, give them care, and the highest price will be obtained.

DISCUSSION.

Mr. Wedge: How do you plant your currants, Mr. Yahnke?

Mr. Yahnke: I plant my currants a little slanting. I lean them to the south, just a little bit south, if I can; in that way the sun does not shine directly on the stem. The wind blows mainly from the southwest, and it will blow them straight; the currant will grow straight any way. The currant is not planted deep enough, but if you plant them in a slanting position they

are put in one-third deeper into the ground, and, therefore, you get a bigger bush right away. If you have got a large spade and a boy to assist you, you insert your spade into the ground, move the soil and put in your plant, and then let the soil drop down again, and your planting will be just as satisfactory as any way you can do it.

Mr. Harris: What age plants do you use?

Mr. Yahnke: I use nothing but first-class plants one and two years old. I raise them myself from cuttings. I heel them in and then plant them just as soon as I take them out of the ground. I do not like to expose the roots of any plant to the air or sun any longer than necessary, no matter whether it is a fruit tree or a cabbage plant.

The President: How do you explain this difference in regard to the same varieties? Do you think they should have a clay soil?

Mr. Yahnke: My experience is that they do better on sandy loam than on clay soil. I think they have a sweeter taste, and the sweeter the taste the higher price you will get for them.

Mr. Barnes, (Wis.): You can arrive at a happy medium by planting on a sandy soil with a clay subsoil.

The President: Why a clay subsoil?

Mr. Barnes: They will fruit later and stand more drouth.

The President: Is not this the whole point, that there is more moisture furnished?

Mr. Yahnke: That's it; there is more moisture.

Mr. Barnes: A sandy surface soil gives the fruit a better flavor.

Mr. Wheaton: I would like to say a word in regard to the care and cultivation of currants. I am quite busy at the weedy time of the year, so I use strawy manure to cover the whole surface over. I would like to hear the experience of others in regard to cultivating by covering with straw.

Mr. Busse: I like the mulching very much, but during a number of years I have found that the roots grow too near the surface, and after three or four years the roots will be on top of the ground.

Mr. Yahnke: I have tried mulching, and have tried cultivation, but I like better to mulch with a layer of manure. It keeps the ground in better condition and keeps the roots more in the ground. By heavy mulching with straw the roots get too near the surface, and in a hard winter or dry summer they will be injured. I like to mulch with chip manure we get on the wood pile.

Prof. Lugger: Whenever and wherever you have saw flies, you should not mulch plants.

Mr. T. T. Smith: Is there any advantage in mulching with coal

ashes? Is there any fertility in ashes, or are there any benefit in keeping the ground moist?

Mr. C. L. Smith: On sandy land a reasonable quantity of coal ashes is very beneficial, but on clay land I thought they were an injury. I tried them on both.

Mr. Hartwell, (Ill.): I do not believe mulching is a successful practice for the farmer. It is an effort to do a thing easily from which you do not obtain good results. Mulching will hold moisture under limited conditions, but in a mulched blackberry field many of the berries dried up, while in the one that was cultivated the berries were in a much finer condition, and the mulching had been very thoroughly done. I put it on in May, and the ground was very wet when I put it on, but when I dug down below the straw the dirt was as dry as it well could be. The remark made as to mulching being a nest for breeding pests is a well-timed statement. I do not know what is meant by discarding the currant bushes; if they are pruned well and properly they will run as long as the majority of men's existence.

Mr. Richardson: I farmed for sixteen years, and I did not have much time to bother with currants. They stood in rows six feet apart, and they got full of quack grass. I took a two-horse plow and turned the sod over on the bushes; then I went to an old chip pile and cleaned up all I could get and covered the ground four or five inches deep, enough to kill the grass; then I put on manure six inches deep, and the next year I rented the place. I was back there two years ago, and the bushes were lying flat on the ground, bushes four feet high. I know I made a success of it by mulching freely enough to kill out the grass. At Winnebago City I had good success in putting in the bushes six feet apart and mulching the rows, that is, mulching between the plants and cultivating on the outside.

Mr. T. T. Smith: I would like to ask Prof. Lugger whether mulching with clover or green manure would invite the insects?

Prof. Lugger: The insects will mature at a time when the mulch is dry and will spin cocoons anywhere you give them shelter.

Mr. T. T. Smith: Then one way of solving that question would be by keeping the fruit perfectly clean?

Mr. Lyons: I think using only straw and removing it late in the season will solve that question.

Mr. Tomlinson: The gentleman from Illinois said the way to keep the currant bushes going is to trim them. How does he do that?

Mr. Hartwell: I cut out the old wood every year, and I get lots of fruit.

Mr. C. L. Smith: In answering Mr. Tomlinson's question in regard to cutting out the old wood, I would say cut out the canes whenever they begin to turn black. This year's growth of wood, at the close of the season when you come to clean them up, you will find to be gray, and in two or three years, if it is clean and healthy, it will be a grayish brown, but the fourth year it will change to black and will be black from one to three years, then it will begin

to turn gray again with small black spots. When the bark gets smooth and black I think it is time to cut it out. Every time I go through in September, fixing them up for winter, I cut out all the suckers that have been missed; and sometimes I pull them up in the spring, then in September thin out all that are sickly, if it takes every one out of the hill, but if you can save three, four or five of the strongest, straightest canes that have good terminal buds, that have grown so strong that they will show green, smooth bark instead of gray bark, and cut out enough of the oldest wood to keep the balance in good condition, as the gentleman says, you will not live long enough to see the plantation run out. If I was growing a plantation I would not put them eight feet apart; I would rather put them six feet. I have some six years old six feet apart, and we can just barely get through. I keep them thinned down so they will not crowd at six feet. I planted two acres last year and planted them six feet apart, and I am in hopes they will not grow big enough so we will have to cut out in order to get between them. Currants want manure, I think somebody said, once in two or three years. I would say every year. I go through and do this trimming in August or September, but after we have got through with the weeds, I go through about the middle of August and clean out the old wood, clean out the suckers, then tie up the bushes in a bunch with string, and then there is a chance to get close to the hill to loosen up the soil with a spading fork and to manure the ground, not just around the hill, but the whole surface. I put wood ashes on mine, but as much as a peck to a bushel is too much; but I would say about two quarts scattered around it. I know a lot of people who mulch and who do no trimming for three or four years, then they clean up their currant bushes; and then they have to wait two or three years before they get a crop of currants. I apply the manure after I get through trimming and cleaning out in August or September. I leave it on top of the ground and do not do any cultivating until after the frost is out. I prefer to get it on the ground before it freezes. I have sometimes put it on after the snow came.

Mr. L. R. Moyer: What would you do for the currant borer?

Mr. C. L. Smith: I always keep lots of chickens. I take the nests of the setting hens out of the chicken coop and carry them out in the currant bushes, and let them hatch the young chickens there and stay there, and I have never had any trouble with insects. But as I am never troubled with insects that is a question on which I can give no positive answer.

Mr. Yahnke: I had just the opposite experience. My chickens will hatch in the currants, and I have a currant patch close to the chicken yard, and if the currant worms would eat chickens I would not have a chicken left. (Uproarious laughter.)

Mr. T. T. Smith: I would like to have Mr. Smith tell us how many chickens it would require to keep an acre of currants clean?

Mr. C. L. Smith: I said that is a question I could not answer. I have never had any experience with worms. I have a good planta tion of currants eight years old, but I have never seen a sign of a

borer or currant worm in it. I have found sometimes in my trimming a few little knobs that looked as though some insect had stung the cane, but when I find a knot of that kind I cut it off and burn it up. I thought, perhaps, it was on account of the higher cultivation I give them. I do not know whether it is the chickens that keep the worms out; I have chickens there, I know I have no worms.

Mrs. Crooker: I was just going to suggest one thought. I once asked Peter Gideon how he got rid of insects in his fruit, and he said he induced his chickens and turkeys to stay there and after a while he got rid of all insects.

Mr. Howe: What is the best time to plant currants?

Mr. C. L. Smith: Any time from the first of September to the first of June; the quicker you plant them the better they will be. So far as my own choice is concerned, I would plant just as soon as the frost is out of the ground in the spring, if I made up my mind now, and if I made up my mind in July I would plant the first week in September.

Mr. Tomlinson: I learned a few years ago that mulching was everything. I tried it and I find it leaves the roots on top of the ground.

Mr. Harris: Cultivate them.

The President: I have had an abundant experience with mulching and have gone back to cultivation. It is not so much the mulching as the fertilizing. I have not been able to make a success of mulching. I have taken a patch of apple trees and put on a mulch several feet thick, and I could not make a success in that way. The weeds grew up all the same six feet high, and it was such an unsightly thing that I got disgusted and plowed it up. I cultivate everything now.

Mr. Harris: I have often written articles and had them published recommending people when they set out currant bushes or any other bushes to mulch them, and yet I have not mulched any with straw or any other material. But when I speak to an ordinary farmer I say "mulch." If you are short of material and put on an inch or two, that is a kind of mulching, but cultivation is a better one way. The reason why I object to it is because the roots will come out above the soil and leave them exposed. Another reason is on account of the mice; it makes a fine harbor for them. Putting manure on the currant bushes is a very different thing to conserve the moisture.

Mr. Yahnke: Mr. Smith was speaking about planting currant bushes six feet apart. I think that distance is too near to plant them both ways. I do not see how he gets more plants on the ground by planting six feet apart each way than he would by planting 5 x 8 feet. How can he spray them, and how can he get in to get the manure between the bushes? I can get all around between my currants except where I have them planted one way. I go in with the one-horse plow and throw the dirt up towards the bushes and then level it down with the cultivator.

Mr. A. G. Long: If you will permit me I want to go back again

to the matter of currant worms. I think it would be a good idea to encourage the presence of snakes, the common garter snake, in our currant patches. (Laughter.) There are perhaps a half dozen big fat snakes among my currant bushes, and very frequently during the summer I find them in the tops of the bushes, and those are free from currant worms.

Mr. Hartwell: Where do you find pickers?

Mr. Long: I have six boys of my own at home, and they have all been brought up like their father, not to be afraid of snakes and not to kill a snake. When they come to a currant bush with a snake in it, they shake it out and pick the currants. Snakes will keep a place entirely free from mice by killing the young in their nests.

Prof. Lugger: A snake could not eat currant worms for physical reasons and chickens will not eat them on account of taste, but the good they do is by moving about among the bushes and shaking down the worms. A great number are killed by being shaken off when they are not able to crawl back again. It is really a benefit to have snakes and chickens in the currants, but not a direct one.

Mr. Yahnke: I do not want to depend on snakes and chickens; I do it myself by spraying.

MY METHOD OF GROWING TOMATOES.

AUGUST WITTMANN, MERRIAM PARK.

In growing tomatoes my chief aim is to get early, smooth and large sized fruit for the market. To obtain this result, it not only requires extra labor but good and sound judgment and, last but not least, a sufficient quantity of seed. I always, without exception, raise my own seed, selecting the first ripe, smooth and largest tomatoes. I take out and thoroughly dry the seed, clean the same and then store it away in labeled packages in some dry place until seeding time.

On about the first of March, I begin seeding in a previously well prepared hotbed. When the plants are about three inches high, I transplant them into another well prepared hotbed, so that they will stand about three inches apart each way. On sunny days it is necessary to screen so as to protect the tender plants against the sun's rays until they are well started. In order to obtain strong and short stem plants, plenty of air and sunlight are absolutely necessary. At the time when the plants are about six inches high, I again transplant them into another also well prepared hotbed, but this time so as to allot about fifty plants to a sash. At each time of transplanting I set the plants a trifle lower than previously. To obtain hardy plants I remove the sash on warm sunny days after the second transplanting, but replace them again at night or on the approach of a storm.

The larger plants require watering more frequently than the smaller ones. It is always best to water in the morning, especially so when cold water is used, so as to give the sun a chance to take off the chill.

About the 20th day of May, providing the weather is favorable, I begin to transplant in the open field. At this time my plants are well developed, are blooming and bearing fruit of about one-half of the full grown size. It is hardly necessary to say here that the transplanting has to be done very carefully. The first thing I do before starting to plant, is to saturate the the beds thoroughly with water, then remove the frame, cut the soil into squares with a large knife, so that one plant will stand in the center of each square. Then I take a sharp spade and cut under the plants, thus making a cube for each plant. These cubes with the plants are removed carefully into plant boxes, holding about forty to fifty plants each. Three of these boxes are placed on a bob-sled and with two horses are drawn out on the field. The fall previous the ground was well plowed, and immediately before planting it is plowed again, then harrowed and marked out in three feet squares, which is sufficient for the Dwarf Champion, which variety I principally grow. The other varieties, such as Acme, require four feet square.

One man will dig the holes for the plants—but these holes must not be any deeper than the height of one of the cubes above mentioned—another man will carefully place the plants in the holes, and a third one will finish the planting. In this way we will keep on for one day. The following day we begin what I call hilling, which is done by drawing the ground towards the plants with a horse cultivator. Then we follow with hoes and draw the ground around the plants so as to form a cavity, sufficiently large enough to hold about one-quarter pail full of water. After the plants have been watered and the water absorbed by the soil, fine earth is put around the plants to prevent baking. In about a week from the time of planting I again cultivate with a horse, and after this the cleaning and hoeing has to be done by hand.

Proceeding the way as above directed, the plants are hardly interrupted in their growth by the last transplanting. It may be necessary to say here that the Dwarf Champion makes an exception to other varieties. It is a common practice to plant tomatoes on a sunny hillside or where land is not so rich, but to be successful with the Dwarf Champion a richly fertilized soil is absolutely necessary. By following my method I assure you that under ordinary circumstances a good and paying crop can be secured.

APPLE BARREL LEGISLATION.—The state vice-presidents of the National Apple Shippers' Association are directed by the society to prepare proper resolutions urging the enactment by their respecitve state legislatures of laws making the legal barrel for apples conform to the package adopted by the association. This is 17⅛ in. head and 28½ in. stave, with bulge not less than 64 in. outside measurement. The association also urges the necessity and fairness of the adoption by the transportation lines of a uniform weight of 150 lbs. for a barrel of apples.

GROWING EXTRA EARLY MELONS FOR MARKET.

H. C. ELLERGODT, LANESBORO.

Melon plants can be started in greenhouses by planting the seeds on small pieces of sod about three or four inches square, with the turf turned down. Those that have no greenhouses can build a small and cheap one on the south side of some out-building to protect it against the cold north wind and have part of the slanting roof covered with a few glazed sashes, made for that purpose, and build a small brick furnace to keep the air warm until the seeds have sprouted. When the plants have attained some size, the house must be ventilated every day, to harden the young plants before they are transplanted out into the open ground.

The piece of ground where these plants are to be set out, should be thoroughly prepared and the hills well enriched with fresh horse manure, which will heat and keep the soil warm underneath in the early spring, when the ground is generally cold. Boxes about ten or twelve inches square should be made, covered with thin sheeting and set over the plants in the hill. Sheeting is better to cover the boxes with than glass, because it will admit sufficient air for the plants and keep them safe from frost on a cold night.

The plants must be looked after occasionally, and if any turn yellow and are sickly looking more air must be admitted by raising the box from the ground on the south side by placing a lump of dirt under it.

When the weather gets settled and the days get warm, the boxes can be taken off in the day time and replaced at night, until the weather is sufficiently warm to take them away entirely.

THE LOCATION OF SHELTER BELTS AND THEIR USES AND VALUE.

G. W. STRAND, TAYLOR'S FALLS.

The opening of this winter's campaign, no doubt, brought this subject very forcibly to many of our minds, as we slowly wended our way through the drifts of snow to the barn or some other building, with no little difficulty.

Surprising it is to note the number of homes in a timber section that are as cheerless and exposed to the elements as on some open prairie. Having stripped Mother Earth of her natural garb, they are now in position where they realize the folly of their actions.

The prairie settler, on the other hand, as soon as he has become well established in his new location cannot but think of the comfort and protection a shelter belt or grove would afford, not only to himself and family but also to his stock and the tenderer forms of plant life.

Recognizing the modifying and congenial influences of forest growth, all of our successful horticulturists are located in timber sections or have surrounded themselves with shelter belts.

The intrinsic value of any shelter belt depends largely upon its position relative to the surroundings and the method of planting.

If any one fault crops out in the plantings of such more than another, it is either that some short-lived variety has been planted exclusively or else it is the same as we generally find when it comes to the farmer's fruit or vegetable garden, that of conservatism, crowding them into as small a space as possible so as to save as much land as he can for the growing of general farm crops, thereby often making as great a blunder as that of not planting any at all. But there is a place for everything, and on any farm this one particular place requires no little thought to locate and properly conduct. The question is how to get the advantages and not the disadvantages.

To a certain extent shelter belts are detrimental, inasmuch as the accumulation of snow, in bordering fields, prevents the early working of the soil in the spring. This is also a complaint quite often uttered against trees planted along a public highway, as they keep the road in a muddy condition for a much longer period. But where planted far enough apart, their pleasant shade during the hot days of summer more than repays for the added trouble the slight drifting they might cause would occasion.

It is from those piercing blasts of winter, coming from the north and northwest, and also the dry, hot southwest winds of summer, that we seek protection mainly, and, hence, aim to have the main tree growth to the west and north of us.

The inconvenience caused by the drifting of snow to the leeward of a body of trees or other obstruction requires that such a planting should not be placed closer to any path, roadway or building than 100 feet. There is also a great advantage in having an entire row or two, about three rods from the inner or main body of trees, the space between catching and holding considerable of the drifting snow.

A shelter belt around buildings should be of some of the taller, long-lived varieties, and a mixed planting is generally to be preferred to any single variety, being not only more permanent but also more pleasing to the eye.

METHODS OF PLANTING STRAWBERRIES COMPARED.

N. C. ERNST, DODGE CENTER.

In treating this subject, I shall first lay down three fundamental principles by which to compare the various methods of planting.

The first, and perhaps the most important, is to be sure that the roots come in contact with moist earth, which, however, should not be very wet. The second is of almost if not quite equal importance, viz.: to spread the roots and firm the ground around them. The third I consider of less importance, but if the planting is to be done on a large scale it will be found to be very essential, viz.: economy of labor.

As the preliminary work, such as choosing a location, preparing the soil, etc., enter in as important factors of success in the culture of strawberries, we will briefly mention a few of the most important.

In preparing to lay out a strawberry plantation the first thing that comes up for consideration is the location. Strawberries will grow

and do well on almost any soil that will raise a good crop of corn; consequently, the soil is of minor importance. I would prefer a north slope and not very sandy, for the following reasons: In this section our berries are injured more from late frosts than from any other cause, therefore, the later we can have them bloom the better. The ground does not thaw out as early in the spring as on a south slope; so there is less danger from frost on a north slope. The more sand there is in the soil the sooner they will start, so I would not want it very sandy. I would, however, prefer some sand in the soil.

After the location has been selected, the next step is the preparation of the soil. Unless there is clay very close to the surface, the land should be plowed deep in the fall and manured during winter or spring; plowed again quite shallow and the surface worked up fine, when it will be ready for the plants.

There are various methods of planting, but I will mention only a few of them. One way practiced in some localities is to remove some dirt with the hand from where you wish to set the plant, insert the plant in the hole thus made and draw the dirt around the roots and firm it. Where the ground is mellow this is quite a rapid method, but is open to the objection that dry dirt from the surface is placed next to the roots, and in a dry time they are liable to dry out.

Another method used a great deal in this state is with the spade. This takes two men or a man and a boy. One man inserts the spade into the ground where the plant is to be set and pushes the handle fromhim, thus pressing the dirt to one side. Another man or boy follows with the plants,and inserts the roots of one, after spreading them out nicely, in the hole. The spade is then withdrawn and inserted about four inches to one side, and pressed toward the plant, pressing the dirt up to the roots. The only objection to this method that I can think of is the difficulty of properly firming the ground around the bottoms of the roots, and that it takes two to plant them this way.

I will mention only one other method, and that is the dibble or trowel. It is used the same as the spade in making the hole, but the ground is firmed around the roots with the fingers and the dibble, thus getting it packed firmly around the roots at the bottom and all the way up. This method gets the roots down into the moist ground, admits of firming the ground all the way up, and is as economical of labor as any that has come to my notice. It is the only one that stands the test when judged by the three rules mentioned above, and I believe the most successful one in actual practice.

DISCUSSION.

Mr. Wedge: I would like to ask Mr. Underwood if he uses in common practice the transplanter he mentioned here some years ago, or is it used only under certain conditions?

The President: If you have soil where you can use the trans planter it is very much superior to any other method, and we do not plant any other way. I do not suppose you could use it

in clay soil, which probably would be too hard, but on our soil it works admirably. The plant does not know it has been transplanted, and you can get a much finer growth in that way than in any other. I do not think there would be any difficulty in using the dibber or spade in transplanting and firming the ground. I believe plants can be set so firm that they cannot be pulled up without destroying the plant by setting with the dibber and using the foot also. I think the great secret of success in planting strawberries is in properly preparing the plants before planting. The roots should be pruned off a little and the tops taken off. I think that is where people fail largely in planting almost everything.

Mr. C. L. Smith: How close would you trim the tops?

The President: If there were one or two small leaves on that had made a small growth on the plants I would take off almost everything else. If there were several large leaves and no small ones, I would leave only one.

Mr. C. L. Smith: Would it be better to leave only one?

The President: Yes, I think it would be best to leave only one. If you set plants out and leave the tops on as received, if they have made a large growth it takes too much of the vitality of the plant to keep alive this system of growth, and it does not seem to form a new growth as readily.

Mr. Hartwell: Would you recommend cutting those leaves off in a moist, cold atmosphere, or in ground in amoist condition?

The President: I could see no harm in it. Of course it is a little more dry in this part of the country, but I took my first lesson in strawberry planting in your neighborhood, and I have found it a good plan to follow.

Mr. Hartwell: I think, as a rule, you are right, but I like to give the plant the benefit of a start if the ground is in good condition.

The President: The original roots and tops are of not much consequence, especially the tops; it is the new growth you want.

Mr. Taylor: Do you find it a good plan to cut the roots?

The President: Yes, I think so.

Mr. Hartwell: If I had a nice moist day to plant I would let that go.

Mr. Harris: So would I.

Mr. Elliot: It seems to me in the transplanting of strawberries the same rule holds good as in the transplanting of trees. In forest

transplanting the most successful method is to remove a portion of the top. We have got to balance the tops with the roots. The method in strawberries is to take away a portion of the root and a portion of the top, but if you have all leaves and no roots, or take away a portion of the roots it draws too much on the substance of the plants.

The President: The chief requisite in successful planting is moisture. Now the best way to secure that is by firming the plant. That is the main point, to get the ground firm around that plant, and that holds good with regard to strawberry, cabbage, tree or any other kind of planting. We have often repeated this instruction to our planters; to practice setting a plant firmly in loose ground, and keep on until they can set the plant so firmly that it cannot be pulled up without breaking. That is the whole secret, to set the plant firmly in the ground. If they will do that perhaps it will not make so much difference if you do let the leaves remain on the plant. I do not think those leaves furnish a great deal of food to the plant, but rather they exhaust the moisture and vitality in the root. That is the theory. Anyway the practice is that if you take a thousand plants and take off the tops and take another thousand and leave the tops on, those that have been topped off will do the best after planting.

Mr. Hartwell: In regard to firming, I will state that my practice has been after setting the plants to go over them with a three-horse roller weighing 1,500 pounds. Then I follow with a Breed weeder. What you want to furnish is a dust blanket. As soon as you make the surface hard, evaporation goes on faster, and on a dry, hot day the plant will dry out before it gets any moisture. If you leave the surface of the soil loose, but the roots set in firmly, loose soil on top around the plant, or a dust blanket, it will keep the ground from drying out.

Mr. Sampson: Did he say he used a trowel in transplanting?

Mr. Hartwell: Yes, but I would like to know what kind of a trowel he means. I have a trowel that I got the pattern of from Mr. Schofield, of Wisconsin. The trowel is eight inches long and four inches wide; the handle is set at right angles with the trowel; it is flat and made out of an old disc. I find it very convenient in transplanting.

Mr. Latham: That is the kind to use.

Mr. Hartwell: I can set 500 plants a day myself with the help of a boy. The boy carries the plants and drops one in advance.

Mr. R. A. Wright: Do you work that on your knees?

Mr. Hartwell: Yes, sir.

The President: I can suggest a different way by using a dibber.

Mr. Hartwell: What do you mean by a dibber?

The President: If you would take off that short handle and put on a long handle and let the boy do the knee work, and after he has put in the plant if you take that dibber and insert it again you can make that plant very firm, you can do it a great deal easier and you can do it more comfortably than by any other method. The man with the dibber does the firming; he has got both hands, and he can work to good advantage, a great deal better than if doing the work on his knees, as I think you will find out if you use the other system.

Mr. Latham: I had quite considerable experience in growing strawberries fifteen or twenty years ago; I know I had remarkable success in transplanting. It was a very rare thing two weeks after planting out an acre or more to find a dead plant. I used the dibble, as described by Mr. Hartwell. It is about three inches wide, one-half inch thick at the center, beveled on both edges and tapered towards the bottom. The ground was plowed in a thorough manner, and within a half hour after plowing we were setting plants. I never plowed an acre of ground and then left it to dry. The plow was followed by the harrow, and the men followed the harrow immediately, stretching a line and running over it a roller with slats marking the distance apart for the plants, and these intersections were the exact spots where the plants were to go. The boy preceded the planter a little and laid the plants at the cross sections, and the planter followed setting the plants with the dibble. There was no dry dirt to fall into the hole. The planter would spread out the roots with a shake, then insert the dibble and put the plant in the hole; then he would again insert the dibble three or four inches from the plant and at an angle of 45 degrees, shoving the dibble far below where the roots of the plant were and at the same time with the fingers of the left hand taking hold of the plant around the crown and holding it firmly until the dibble had been pressed upwards and against the roots of the plant and withdrawn, afterwards filling in the depression left with a blow or two with the dibble. A man can put in 300 plants or more an hour in this way with a boy to handle them. The roots were pruned, which gave a better opportunity to spread them, and the leaves were all taken away with the exception of one or two small ones. By following this plan, with sufficient care, I am sure, without waiting for wet weather, a man could save 999 out of a 1,000 plants.

Mr. Harris: If I wanted to have the very best success in planting strawberries I would plow the ground two or three weeks before setting out the plants, harrow the land and then harrow it again, and leave it until the moisture had been drawn off, and I think you would find it a great deal better than fresh plowing. It does not make any difference how hard it is packed after setting if we have loose soil on top.

Mr. Latham: After the ground has been plowed several days how can you set strawberry plants without having the hole fill up with dry earth?

Mr. Harris: I take my foot and scrape off the dry surface. I think the ground is then in better condition than after fresh plowing.

Mr. C. L. Smith: I know the objection many have to getting down on their knees. I have always recommended the use of the spade. I always use the spade. The gentleman who read the paper said you could not get the ground firm around the roots in using a spade. In using the spade, after the plant is set the spade is set three or four inches back of the plant and then shoved down so it brings it below the roots of the plant and then straightened up; that packs the earth firmly along the entire length of the root, more firmly than I was ever able to do it any other way. I am satisfied I can get the

plant more firmly in the ground, the dirt packed the entire length of the plant, by inserting the spade in the manner described than in any other way without getting on my knees. Then with my foot I throw the loose dirt back around the plant, but the dirt around the roots will be packed firm. In regard to what has been said about trimming: the last three or four seasons I have tried simple experiments, leaving the leaves on and trimming them off in certain rows and I know positively that the rows where the leaves were cut off made a better growth and showed up in better shape than did the rows where the leaves were left on. We have very dry weather and very dry winds, and it exhausts the vitality of the plants to have the leaves on before the roots are in condition to send up any nutriment.

Mr. Sampson: I quite agree with Mr. Smith. I have used the dibble and the spade. I believe the spade is the best thing to use for firming around the roots. I have also tried the way suggested by Mr. Latham and always have very good success. Then I have also tried the plan of putting in the plants during a spell of rainy weather, and at such times I have had quite a good success in letting the leaves remain on the plant, but if it is as dry as it has been the last three or four seasons I trim off all but a few leaves.

Mr. Elliot: Has any one had experience planting strawberries with a machine planter, such as is used in planting cabbage?

Mr. Latham: I have heard the experience of men who used the machine. It drops the plant and waters it at the same operation.

SAN JOSE SCALE AND DRIED FRUITS.—Last summer Switzerland shut out our dried fruits, claiming there was danger of the San Jose scale being introduced through this medium. Exporters appealed to the Department of State, which, acting upon the suggestion of the Department of Agriculture, authorized tests to determine the validity of the Swiss claim. The U. S. entomologists conducted the tests. Large lots of peaches, pears and apples infected with the scale were tested by all known means of commercial drying, sun drying, evaporation with and without sulphur, with the result that each of these processes destroys the life of the scale. In the experiments each scale was carefully watched for several weeks. After the fruit was dried every scale upon every piece in the entire lot was examined by the aid of powerful microscopes. In no instance had the scale survived the process of drying, thus conclusively proving that dried fruits cannot propagate the scale. It is believed that the results when presented to the Swiss government will result in the removal of the embargo against our dried fruits.

SEVERE ROOT PRUNING FAVORED.—Although the horticulturist of the Georgia Experiment Station declines to make any positive statement concerning the advisability of severe root pruning when planting young trees, he says that he is fairly satisfied that peach trees from which the roots have been largely cut off will live and flourish in Georgia even in stiff clay and under adverse weather conditions. The same statement may also be made of apple and cherry trees. In some experiments made the last two years, he found that the root-pruned trees made fewer, deeper, larger and more robust roots. These roots penetrated 17½ inches against 9½ inches for the roots of unpruned trees.

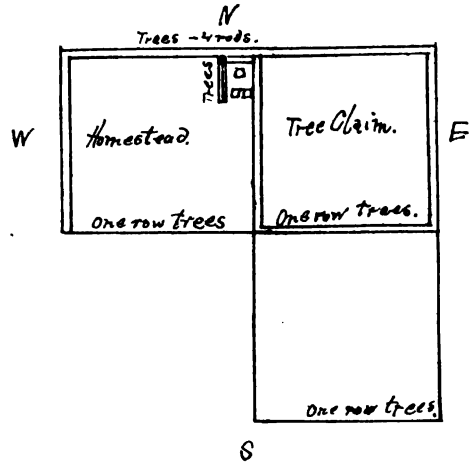
HINTS FROM EXPERIENCE IN GROWING SHELTER BELTS.

CHAS. B. CLARK, MINNEAPOLIS.

My experience in growing shelter belts has been mostly by proxy, though I have done some planting myself. I was raised on a farm in Waukesha county, Wisconsin, but for the past twenty-four years have been a commercial traveler. As such, however, I have many a time driven over the western prairies during a snow storm and have frequently faced heavy winds, so that I know how to appreciate fully the blessings to be derived from good shelter belts, and this accounts for the interest I take in growing them.

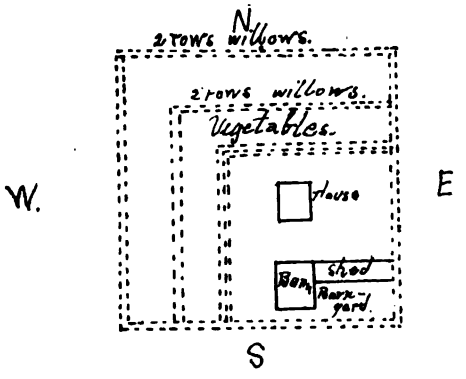
I have a farm at Eldridge, in Stutsman county, North Dakota, where I have grown twenty acres of trees, and I have also planted and cared for three tree claims of ten acres each, in addition, near my farm. I have made a success of all of these plats of trees so that the trees are now from twenty to forty feet high, and title was obtained from the government upon all of these claims (including my own) by having the required number of trees of the proper size at the time of final proof.

Shelter belts can be grown in either Minnesota or Dakota east of the Missouri river if you subdue the land thoroughly before planting, if you plow deep and if you plant your trees thickly. These are the three essential points, but the deep plowing is the most essential. Of course, the trees must be taken care of after planting. They must be cultivated, and the grass kept subdued until the trees shade the ground completely.



On my tree-claim, I planted a strip nearly four rods wide all around the outside, and on my homestead, which joins my tree-claim on the west, I planted a strip on the north and west sides, about the same width, and one row of trees on the south side, besides some strips for shelter on the north and west of my buildings.

In planting shelter belts I want to recommend one thing for the prairies of Dakota and western Minnesota, which I have never heard any one else suggest. Plant the trees around your buildings in such shape that the snow will not break them down, and at the same time they will gather and stop the snow so that but little will lie in drifts near your buildings. Farmers should go to the cuts on the railroads for instruction and examples, and study the way that the section men place the snow-fences to protect those cuts from being filled with snow. I suggest that your building plat should be



nearly square, and that the buildings should be placed a little to the southeast of the center. Plant two rows of white willows, eight feet apart, all around the outside, and the trees one foot apart in the rows. Four rods inside of this, all around, if you wish, but surely on the north and west, plant two rows more in the same way. Three rods inside of the last two rows on the north and west, plant a third strip of two rows in the same way. By following this plan, I think you will find that after severe storms in winter the most of the snow will lie in huge drifts in the wide spaces between the rows of willows; and that, except in extremely severe winters when the snow is very deep, little will gather around the buildings. I do not recommend planting wide strips as I have done, because the trees break down so much worse. The strips should never be more than two rods wide, and one rod is much better.

In growing willows, I have found that the most successful way is to plow a furrow and lay the trees or limbs in that furrow with notches cut in the willows frequently, and then cover the willows with a hoe, leaving those notches exposed slightly. The best way to grow box elder and ash is from the seed planted right where you want the trees, so as not to have to transplant them.

I have done some mulching with manure and found it very beneficial. I have planted several kinds of deciduous trees and made them all grow except the walnut and butternut. After fifteen years hard struggling, last summer they were less than four feet high in a grove of cottonwood and box elders of the same age. I like the white willow the best for strips and the ash for a grove.

I have never tried evergreens, but I have seen some strips near Ripon, Wisconsin, which were planted by the C., M. & St. P. R'y. Co. along their cuts, which seem to do the work they were intended for perfectly, and, at the same time, they are very pretty. It would be a very hard job to start them in Dakota. My farm is a noted farm on account of the abundance of trees growing on it, and it is a noted fact on my farm that crops are much better within a distance of fifteen rods of the trees on the north side of the strips that run east and west than on the open prairie. I am positive that if all the farms of Dakota could be divided into forty acre fields by strips of trees running east and west, making the fields 40 rods wide and 160 rods long, crops would be much better, especially in dry seasons, when the hot winds from the south play such havoc.

DISCUSSION.

Mr. C. L. Smith: How near were those walnut trees?

Mr. Clark: Right up against them.

Mr. Dartt: I would like to know if a great deal of advantage does not come from the result of that snowdrift being stopped and carrying that moisture in the soil in the spring when it melts.

Mr. Clark: Usually there are snowbanks on the south side of those strips. I have seen evidence in the spring that they had been twelve feet high, because the jack rabbits have taken bark off that high up, and those banks are usually on the south side. You find the effects best on the north side of the trees. I do not think it is that, but it is the protection from the south winds. When we get no snow at all we observe that same difference.

The President: Do you think it would be practicable for people in general to plant out willows and then ash and next to the ash a belt of evergreens? Could they be made to live and be a success, and would not those evergreens, if they could be made to live, make a better wind protection both for summer and winter?

Mr. Clark: I think undoubtedly the evergreens would be better. What evergreens I have seen in Dakota are a scaly looking lot of trees. There might possibly be such a thing as making a success of them by having them protected by willows and giving them thorough cultivation. I presume they would not break down. I find if you plant in strips you have got to trim them pretty well. If the strip is four rods wide all the limbs on the inside will break right down. The winds are so fierce and the snow piles up so high that it breaks every tree right down, and you have got to keep them above that snow.

It seems to me it would be better to make that strip narrow and leave a space, and then you could put your evergreens in.

Mr. Dartt: Where would you have your fruit trees if you had any?

Mr. Clark: I have studied that a good deal. I think the best way is not to have any. (Laughter.) We can ship in enough from Minnesota. I think I should put the fruit trees on the north side of the shelter belt.

THE FARMER'S VEGETABLE GARDEN.

A. K. BUSH, DOVER.

Not one farm in twenty has a garden worthy the name—a deplorable fact, and that, too, in a country where vegetables in large quantities, of superior quality and in wonderful variety, can be grown with but little work, aided by some skill and the energy that characterizes the average Minnesotan.

The conditions are favorable for a first class vegetable garden on every farm in the state, but the opportunity, like many others, is not improved by our farmers. Scott says: "Of all sad words of tongue or pen, the saddest are these, 'it might have been.'" We might have bearing orchards all over the state furnishing home grown fruits of the best quality to every family in the country; we might grow small fruits in large variety in every garden; we might have flowers in great profusion, and home grounds protected and adorned with beautiful trees, shrubs, etc., all made most beautiful and attractive, perfectly developed under the influence of our clear skies and fifteen hours in the day of sunshine. But it is the old story of missed opportunities. Still they return every spring time with added promise. Why not improve them?

In the south, people live largely on "hog and hominy;" they prefer this simple bill of fare to working in the garden. Minnesota farmers are not *too lazy* to make gardens, but are *too busy*. I know just how it is. While at home on our farm of several hundred acres, when I had all my teams and help in the field, and I was as busy as a man killing snakes, taking care of the young pigs, calves, lambs and colts, my wife would say: "We should have a garden made. You enjoy the vegetables and fruits. They also help so much in giving variety for our table. Again, the children should have less meat and sweets and more of a vegetable diet to develop a healthy body and vigorous pure minds." I would agree with the statement but still neglect the garden.

Time is worse than wasted if used to criticise an evil with no effort or thought of a remedy to substitute the same with something which shall make the world better. I have in mind a practical method by which the "weed patch," the common apology for farm gardens, can be converted into a clean, productive, profitable "Farmer's Vegetable Garden." Here it is:

Dedicate an acre of the best land on the farm, near the house buildings, to the *garden*, making the same 10x16 rods. Enclose this with a good pig-proof fence; outside of this an evergreen hedge. As I propose to establish a three year's rotation, divide it into three equal fields, each 3⅓ rods wide. The first season plant one field to sweet corn, one to potatoes or some root crop, one to vegetables. Sow common red clover with the sweet corn the last time it is cultivated, and this is quite sure to grow. The stalks should remain standing in the ground to protect the clover during the winter and early spring.

The second season the potatoes will be dropped out, except a few early ones. The sweet corn, which should be of several varieties, from extra early to the latest, will be planted where vegetables were grown last season (sow clover seed with the corn as before), the vegetables to follow potatoes. The clover should be plowed down in June when in full bloom, and this field be cultivated or harrowed occasionally during the summer to sprout and destroy all weed seeds in the soil, and at the same time make the soil conditions most favorable for the vegetables next season. This is better than a summer fallow. Any field to be used for a root crop the next year should be prepared by this method. It will save nearly all the expense and labor of hoeing and weed pulling, also give nearly double the crop. Try it, and be convinced.

The third year the rotation is fully established, which is clover, sweet corn with clover seeding, and vegetables with ground prepared for planting.

I presume it is safe to say all have a good supply of garden seeds on hand early in the year, secured from some reliable grower in Minnesota. Some will be needed in March to sow in boxes in the house, to be transplanted into cold frames or hotbeds, where they will become stocky for permanent planting early in May.

I am much in favor of *very* early planting, especially for all such things as frosts do not destroy. I often cover my early planted beans, potatoes, tomatoes, etc., when frost is threatened, with a hoe, using earth for protection. This is quickly done, and the covering is easily removed with no injury to the plants.

The ground will not need plowing. Go over it with harrow to smooth and dry the surface. Now, remember this is a *farm* garden, where the annual rental for an acre of land is worth no more than two day's labor, and our effort is to economize time, save labor at the expense of land, use horse power and our common corn tools.

Use a corn marker to make rows with, 3½ feet apart, always the long way of the field. Sow seeds with a garden drill—you cannot afford to be without one. The cultivation can be done very largely with the two-horse riding corn tools, in the morning before going into the corn field. This should be repeated every week or after every rain. Frequent shallow and level cultivation is important in garden and field.

Use a skeleton hoe and destroy all weeds when very small. Sometimes this can be done, where some thinning is needed, with a Breed's weeder, or a similar light, home-made harrow, saving much tedious

labor. Two or three crops can be grown in the same row if late beets, parsnips, celery, etc., follow lettuce, radish or other extra early crop; or one can plant squash, pumpkins, etc., with early potatoes, etc., to occupy the ground after they are gone. A little *applied* good sense will save labor and increase receipts. Always use the *head* to save the *hands* in the garden.

Early vines, such as melons, cucumbers, etc., can be started in the garden under glass-covered boxes made to fit a single light of window glass, minature hotbeds, which will force the plants, protect the same from frost, bugs, etc., also gain a month or more on their season. I wish every boy in Minnesota would try this plan and grow melons next year in abundance. Peas, pole beans, etc., should be supported with wire poultry netting. Two or more crops can be grown successfully the same season, getting a crop started on one side of the support and harvesting on the other. Like the boxes, these can be stored and used for several years.

Tomatoes are much improved if grown on a trellis, or the ground is thoroughly mulched with clean straw. Mulch is as valuable in the vegetable garden, during the hot dry season, saving nitrogen and moisture, as it is about the small fruits and trees.

The asparagus row should not be forgotten. Open a wide and deep trench with the plow, partly fill with well prepared compost, plow on some earth. Mix well with cultivator or disc harrow. Make an open row with shovel plow. Use two-year old plants about every twelve inches in the row, and cover with plow six inches deep. Cultivate as you would corn and protect the roots with covering of barnyard manure in the fall. Spread this about the plants in the spring, working the same into the soil with the corn cultivator; 200 roots will plant a row the length of this garden and supply the family, also your neighbors, with material for a table luxury two months each year, when other vegetables are gone from the cellar and not grown in the garden.

Celery can be grown and blanched quite easily by the thick, level method of setting, and is certainly a health giving and delicious vegetable. This state spends thousands of dollars for celery compound every year. Why not save the money and grow our celery? It is always better to take care than to take medicine.

Salsify, or vegetable oysters, is another delicacy which should be found in all gardens, almost equal to the genuine bivalves in flavor and more healthy. It will keep in the ground all winter or in the cellar packed in sand.

The vegetable garden should also contain a few hills of new varieties of potatoes, field corn, etc., *on trial*, which if valuable can be used for seed in the field the next season. With no risk we should be generous in all our planting, both in variety and quantity in the vegetable garden, enough and to spare some for our good neighbors who can't grow a garden; more to can and jug for winter use, which is preserved with flavor almost equal to fresh stock.

Test the possibilities of the one acre garden. It will surprise your family and your neighbors, save doctor bills, add the same to your bank account, etc. If troubled with cut worms in the

garden try Paris green and shorts, one part to twenty—mixed. Sprinkle about the plants you wish to protect. Air slaked lime is said to be a reliable remedy for cabbage worms and perfectly harmless. Dust freely over the plants. Paris green with plaster, about one part to fifty, will destroy squash bugs, and other insects—use with powder gun. For all fungous trouble on plant or tree use the Bordeaux mixture with spray pump; a little Paris green added will destroy the potato bug and other insects.

For further information I would refer all who seek the best authority and guide to successful results to Prof. S. B. Green's "Vegetable Gardening." This book gives practical instruction in detail, is well illustrated, all methods are demonstrations as tested and practiced at our Central Experiment Station, and by other successful growers in the northwest. Also become a member of our State Horticultural Society, the largest and best in the United States, which is the most progressive country and people *on earth*.

DISCUSSION.

Mr. Elliot: I am very much interested in that paper, but there are one or two minor points which he did not cover. One was in regard to the making of boxes as to their convenience in storing. If those boxes are made square they will take up a great deal of room, but if made with an angle so that they will nest it will save in storage, and there will be no waste of lumber.

Another thing in regard to the asparagus bed. Asparagus should not be cut until the third year after transplanting in order to give it time to throw out a good, strong root. If you commence cutting it too early you will find it will not mature.

Then there is the "Irishman's bouquet." I want to tell you how that was grown. It fits right into this paper, and that is the reason I want to explain it. I received a package of seeds from the Agricultural Department, and when I sowed my flower seeds in the spring I dusted a few of those seeds in a six-inch flower pot and set it in the hotbed and put over it two thicknesses of cloth. I sprinkled it every day until I saw that the seeds had germinated. When I saw that the seeds had germinated I took off the cloth and sprinkled on a very light amount of earth, not over a sixteenth of an inch, and then when the plants had got their third leaves I pricked them out into a shallow box, about three inches deep. I put it into one corner of the bed where I had taken out some tomato plants. I sprinkled them and looked after them until they were about three inches high, and on the 15th of July I transplanted them into a hotbed where I had had cucumbers and the vines had got done bearing. I transplanted this celery into that hotbed

four inches each way, putting eighty plants into a bed that is 3x5 feet. When the plants showed sprouts around the base I took them away and used them for celery soup, and when the plants were six inches high I held the tops together with one hand and with the other I worked the soil in carefully around the plants to a depth of about three inches. When they got to be about eight or ten inches high, I packed in the soil and let the celery remain there until we got frosty weather. When we got frosty nights, I put the hotbed sash on the top, and as the weather grew colder I put on a shelter. On the 13th of November, I took it out of the bed and packed it in boxes and put it into my storage room, not having a cellar. That is the method in which I grew celery. No farmer has any need of doing without celery if he wants to grow it.

Mr. Bush: What kind do you use?

Mr. Elliot: I had the self-bleaching.

Mr. Beardsley: The great thing is to quit cutting asparagus in time, then manure it well, and you can cut it the next year as long as you want to.

Mr. Reeves (Iowa): I find there is no necessity for stopping the cutting of asparagus until you want to stop using it. We have an asparagus bed thirty years old, three rows fifteen rods long, the product of which supplies the family and brings an income of $30 to $40 a year.

In regard to celery, I found one year I had about one thousand plants that were not grown large enough for use and not large enough to bleach, so I put it in the cellar. I dug up roots and all and put a layer of good rich earth on the cellar floor, and then I put in a layer of plants with a little earth between each plant, then another layer of earth and plants; then I put a board up close to it to hold it, and I poured water on the floor of the cellar to keep it moist; it would not do to pour it on top as that would cause it to rust. I grew that celery to a good height, and I found no trouble, like the reporter with his squashes, in giving it all away.

Mr. Harris: My experience with asparagus differs somewhat from that of Mr. Reeves. I do not think I can cut mine as long as he does his. I find if I cut a bed pretty severely and then not cut it the next year, the following year I get an immense crop of large asparagus.

THE FRUIT GARDEN WITH AND WITHOUT THE SHELTER BELT.

W. W. PENDERGAST, HUTCHINSON.

Henry Ward Beecher, when asked, by a dude, what he considered the best odor for constant use, answered that the best smell he knew of, was, in the long run, no smell at all. A neighbor of mine, when criticized severely, by an eastern farmer, for not putting something at the bottom of his stacks to preserve the hay, replied that he never built a stack in his life without spreading a load of hay under it.

In the matter of *shelter belts* for fruit trees, it is still a mooted question, whether the expense of buying, setting and caring for them would not yield better returns if applied to setting *more fruit trees*. In treating this subject, it may be well to admit at the outset that it is one which is very imperfectly understood, even by the old stagers, and, further, that I have a firm grasp upon very little that *has* been learned, for which reason I approach it with extreme diffidence.

There are three advantages claimed for the shelter belt:

(1.) It breaks the force of the wind, both in winter and in summer, thus, in a measure, preventing the abstraction of sap from the twigs and smaller limbs, which on the open, wind-swept prairies does so much damage by reducing the vitality of the trees so exposed.

(2.) Fewer apples are shaken from trees thus protected.

(3.) It shades the apple trees during the hot days in April and is of value as a preventive of sun-scald, the deadliest foe of many of our very choicest varieties.

Referring to the first claim, it is true that every tree in a grove arrests and divides the wind, so breaking its force and lessening its power to do harm. We all know that everything containing moisture dries out faster in windy than in still weather. As robbing a tree of its sap is as bad as depriving a man of his blood, anything that can be done to materially diminish the evaporation will be helpful. On the other hand, it must be borne in mind that in power to resist evaporation there is a great difference in trees, both fruit and ornamental. Some that are extremely hardy in other respects fall easy victims to this disease when the circumstances are favorable to its development. The soft maple is a familiar illustration of this fact. I have seen whole rows of large, thrifty trees of this variety cut down by the drying-out process in one unusually windy winter following an arid autumn. All the slender branches looked bright and healthy in the spring, but as they failed to bud and put forth their leaves, I cut off several limbs, and found the kerf perfectly clean and white, though the limb was thoroughly seasoned all the way through. The trees never recovered. The white ash is often affected in the same way, but its capacity for recuperation is greater. It will stand more killing, and when the rains of spring come it will fill up its veins and arteries with life-giving sap, and after a while—sometimes as late as the middle of June—the buds will begin to swell, and by the last of July the trees will be as flourishing as ever. The apple tree, on account of the closeness of texture, both of bark and wood, is less liable to injury from over-evaporation than are

many others which are usually considered hardy. I incline to think that the greatest danger lies in cutting off the supply of moisture from the roots by drought at the close of the previous season. This can be largely prevented by the *dust blanket* system of cultivation and by fall watering, by means of a good well, a windmill and home-made canvas hose. At all events, it seems to me plain that no great amount of good can be accomplished by setting a row or two of evergreen trees around the entire orchard, as the shelter would be too far from the main body of the trees to be protective.

The second advantage of the shelter belt is supposed to be the protection it affords the growing fruit against summer gales, which sometimes entail loss by causing windfalls. Many of the apples thus blown off are, however, wormy or otherwise imperfect; and where they are perfectly sound, the mother trees are generally carrying too heavy a load. But it occasionally happens that trees are almost completely stripped of their burden of fruit, and, in such cases, a certain amount of damage is caused. In my own experience, the great trouble has been to get trees into good bearing condition rather than to make them hold the fruit, once set.

As a preventive of sun-scald, it cannot be denied that some protection on the south side of fruit trees is of very great importance. Hills, bluffs and buildings have proved their great value over and and over again. The lives of fruit trees are often saved by shutting out the hot mid-day sun of April, when we get our first foretaste of summer. This prevents the early circulation of sap, and the consequent unseasonable formation of the tender, succulent inner bark, or liber, which is sure to occur when the so-called protection is on the north side. In this climate, a few weeks of warm, growing weather in early spring time is generally followed by a "cold snap" which freezes the liber, bursting its cells and destroying its life. Then the outer bark, detached from the body of the tree, dies and falls off, and the tree is doomed. In spite of the efforts of the tree to reclothe the dead south half with new wood and live bark, unfavorable seasons will continue to enlarge the dead area until, some fine spring morning, the sad owner says to the hired man, "Cut it down. Why cumbereth it the ground?" When the wound is first discovered, protection may help the neighboring wood to grow over it; but the tree will be, like our false friends, hollow-hearted, and the rest of its crippled life will be unsatisfactory.

As in all other cases, the best way to get out of trouble is to keep out. A *shelter belt* of straw, cornstalks, woven laths or even paper, placed around the stem—thickest, when possible, on the south side—would have averted the disaster, and a vigorous tree, instead of a pile of dry brush, would have been the result.

The great objection to a grove along the south side of an orchard is that it steals both the moisture and the fertility of the soil from the fruit trees in close proximity, while it fails to protect the trees more than fifty feet away from the dread scourge of which I am speaking. Probably all have noted that scant growth and shy bearing characterize apple trees set along the edge of a forest or near to thickets and scattering clumps of trees. It is just the same with those planted along our windbreaks. They all have a dejected

and despairing look, reminding one of the Knight of the Rueful Countenance. The apples are few in number, small in size and gnarly in shape.

What shall we say then? Shall the shelter belt be condemned altogether? I answer, "No," at least, not until it has been given a thorough and satisfactory test. I think there is a way in which valuable protection can be afforded, and I would like to see it tried by some of our horticultural friends, who are not in the business "for revenue only," amateurs who have a taste for the beautiful, and who think there is something worth striving for besides "chops and tomato sauce," or even "sirloin and sundown." Here is the plan: Two rows of Scotch pines, one rod apart, and trees one rod distant in the row, a row of junipers, half way between the pines, set in quincunx order. Let this treble row be twenty rods long, and run east and west. A half rod north of the north row of pines, plant a row of currants—they will do well at that distance from the evergreens for several years. One-half rod further north, put a row of plums. Now you have got where it is safe to plant apple trees; so, half a rod further north, set your first row of them, and at a distance of another rod plant the second row. This will bring you to a line two and a half rods from the pines, and you *may* live to see the day when the trees will be shaded by the shelter belt; if not your children will. Here I will digress enough to say that he who plants evergreens to protect his orchard need not think he is working for next year. He must be content to wait two decades for results. When the pines in our proposed row shall be fifty feet high, they will have a decided influence upon the second row of apple trees, the first having been protected for several years.

Next, one rod still further north, plant a row of hardy hybrid or iron-clad standards not liable to sun-scald; then a row of plums a half rod distant, and a row of grapes (which do best when sheltered from the north), and you have got within one-half rod of the second shelter belt, which runs parallel with the one described,—is planted in the same way, and serves for the basis of the next division of the orchard. Raspberries, gooseberries, blackberries, dwarf cherries, buffalo berries, dewberries, service berries, etc., may be planted, according to the taste of the owner, along the rows nearest the evergreens, taking care to set those that will endure shade the best on the north side, and those that demand the hot sun on the south side. These evergreens may be continued across both ends of the orchard, in which case, the north and the south rows must be set back far enough to allow of a passage way for teams to go in and out at the four corners.

This plan, I think, offers all the protection possible to be obtained by shelter belts. If the rows are placed nearer together, the trees of the orchard will be too much shaded; if placed further apart, too many fruit trees will be unprotected. As a windbreak, it cannot be surpassed, and whatever advantages may be derived from any attempts to prevent evaporation will be secured in the highest degree by this method. The area outlined will cover two and a quarter acres, and provide for 240 apple trees, and 160 each of plums, grapes, currants

and other berries—880 plants. I recommend plum trees for the two rows nearest the shelter belt, because their natural habitat is along the edges of the original groves, and the proximity of the larger trees would injure them comparatively little. All of the distances above given may be changed according to the judgment of the planter. The plums will make no serious complaint at being set only eight and a quarter feet apart one way; and the apples, not being crowded by the smaller plum trees on each side, will stand close setting in the rows.

It must be admitted that the shelter belts take up a large amount of valuable space, and it is very doubtful, in my mind, whether the increased amount of fruit will pay the extra expense of the protection. Looked at, however, from an aesthetic point of view, an orchard such as I have described would be a gem that would ornament any farm. To many people of taste and culture, it would be the one great attraction.

When we come to grapes, and other small fruits which require winter covering, the conditions are completely reversed. These delight in a sunny spot well protected from cold north winds. They like to nestle down on the warm south slope of a hill, or where the genial rays are reflected from a high wall or a sheltering grove. There is no danger of sun-scald with them, for during the trying season they are beneath the earth, out of harm's way. When the danger of hard freezing is over, they will be all the healthier, and the fruit all the sweeter, for the extra heat absorbed. For several years, while the evergreens are growing into usefulness as a shelter, small fruits can be successfully grown in single rows on the south side, halfway between them and the plums, as indicated. I know, from many year's experience, that currants will flourish close to large trees and even in the shade of them.

To the man who intends to grow fruit exclusively for profit, I will say that it is questionable if shelter belts will pay for their cost. To him who thinks more of æsthetics than of lucre, who takes delight in seeing these beauty spots sprinkled artistically, over his farm, and who has the means to gratify his taste, I will say, let all the surroundings of the home be as beautiful as possible. The cravings of his soul will not be satisfied by broad fields of wheat and corn, by blank meadows and naked pastures, nor by twenty rows of orchard trees with twenty trees in each row—but every little hill, every winding path must disclose some touches of beauty, which appeal to the lover of nature adorned by art, and cause his eye to glisten with delight and his heart to glow with gratitude, when he feels that life *can* be made worth living.

EXTRACTING PERFUME FROM FLOWERS.

It is now possible for us to have the genuine extract of the perfume of any sort of flower we desire. Nature and science are combined to bring about this result. The idea is a simple one, and all hinges on the old time method of condensation. The results are gained by taking a glass funnel—any one will do—and over a spirit

lamp letting the glass heat until it is possible to draw the stem fo the funnel to a fine point—that is, to pull it out, to extend it until the proportion desired is gained.

This accomplished, the funnel, should be filled with ice and then placed upon a retort stand. It is absolutely necessary that the pointed end should then be placed in a small glass bottle, but at no time must the point be permitted to touch the bottle itself. After this has been done the stand and the funnel as arranged should be placed in a greenhouse right among the flowers whose odors it is desired to collect.

Now comes the scientific features of the plan, the feature which brings success—condensation. It is a well known fact that in every greenhouse a vapor rises from the flowers. If you happen to be in a greenhouse and the portion you are in is occupied by flowers with strong perfume, just inhale the odor that comes from the glass through which the sun's rays pass. You will notice that upon the glass there is a mist just as is seen upon a window pane on a chilly morning when you breathe upon it. This vapor has about it an odor as distinct as the flowers themselves. If there happens to be a variety of flowers, all of which emit perfume, the combination of odors is an odd one. As a matter of fact the idea for some of the most popular perfumes of the day has been gained in exactly this fashion.

The apparatus described is placed upon the retort stand in the center of a group of flowers whose perfume it is desired to secure. Gradually the vapor rises from the flowers, and in meeting the colder surface of the funnel condenses into drops upon the outside of the funnel. From the point of condensation it trickles down until it drops into the bottle. In a surprising short time a large amount of perfume is collected, and analysis thereof proves that 90 per cent of the contents of the bottle is perfume. The rest is water.

Strange to say, this essence of the flowers needs to be adulterated with spirits of wine. Otherwise it would become sour and useless. —New York Herald.

PROTECTION OF FRUIT TREES FROM MICE.—Farmers care very little for the depredations of field mice upon their grains, but these small rodents sometimes do great injury to young fruit trees in winter. They seldom gnaw the thick bark of older trees, but cases are on record where a young orchard has been entirely destroyed when planted near a meadow or level field frequented by these little marauders. Coarse wrapping paper or a few layers of newspaper, dipped in kerosene and tied about the base of a tree, also a few pieces laid over the nearest roots, will repel the mice, and at the same time prevent the ravages of boring beetles. Field mice, like their cousins, the house mice, are easily trapped. A box trap set near their nests and baited with corn meal will often catch half a dozen at once.—[C. E. Allen.

In Memoriam.

J. C. PLUMB,

MILTON, WISCONSIN.

DIED MARCH 19, 1899, AGED 70 YEARS.

[See Frontispiece.]

Mr. J. C. Plumb died at his home in Milton, Wis., March 19, after more than a week of intense suffering, caused by accident. While hauling a load of wood, a wagon wheel came off, throwing Mr. Plumb to the ground under the falling wood.

Mr. Plumb was born in Stockbridge, Mass., December 1, 1828. In 1840 he moved with his father's family to Oberlin, Ohio, where he studied for two years in the public schools. The family in 1843 moved to Lake Mills, Wis., where one of the brothers of Mr. Plumb had already engaged in the nursery business, which he and his father before him had followed in Massachusetts. With such environment and training, it was natural that Mr. Plumb should soon engage in the business which he followed most of his life, for he was born with a love for horticulture.

When he was sixteen years of age, his father planted some trees and put them into his charge with the promise that if he took proper care of them they should be his. This was his start in the nursery business. And that he gave them the proper care no one who knew him needs to be told. He soon became a partner with his brother in the nursery business and followed this work most, if not all, of the time until his death, making a period of fifty-four years in which he was actively engaged in horticulture.

For a few years he resided in Madison, Wis.; from whence he came to Milton in 1867. The following year with his son, Malon J., he established the Green Hill Nursery, and carried on a business of great value to the little village in which he lived. At one time the annual planting of this nursery was 100,000 trees, one year reaching 325,000.

Mr. Plumb's natural qualifications for this work were strengthened by the fact that he was a close student, not only of books, but also of nature. His principal interest was in trees and fruit, especially the apple. He was deeply interested in geology also. His constant observations gave him a practical knowledge of the soils in every part of Wisconsin, and to a large extent in other neighboring states.

From its beginning, Mr. Plumb was greatly interested in the Wisconsin Horticultural Society, of which he was an honorary life member. He is sometimes spoken of as its father. He called its first meeting, was its first secretary and wrote the constitution first adopted. Since its organization he had served constantly as chairman of its standing committee on nomenclature. He has also held the offices of vice-president and corresponding secretary. He

has represented the society on several important occasions, at one time being secretary of its committee of exhibition at the Centennial Exposition, when he arranged the Wisconsin exhibit. He also collected the Wisconsin Gold Medal exhibit of apples at the New Orleans Exposition. He was a member at one time of the general fruit committee of the National Society. He had in charge the preparation of the horticultural history of Wisconsin for the semi-centennial of the state. He was authority on Wisconsin fruits, and no man was more competent to judge of the value of a new species of fruit for propagation in this climate.

One of Mr. Plumb's most important contributions to Wisconsin horticulture is the "Plumb's Cider" apple. This apple is one of several seedlings which the Plumb family brought from Ohio. This variety proving to be a fine apple, they propagated it, and it has been grown extensively in Wisconsin and probably throughout the northwest.

Mr. Plumb was a member of the Congregational church for fifty-nine years, and was of great service in the Milton church, holding offices of importance most of the time since his first connection with it, thirty-one years ago. He was greatly interested in Sunday school work at home and throughout the state. He was also an ardent prohibitionist in politics, and an enemy of evil of all kinds. He was a member of the Milton College board, and has often furnished work for many a needy student.

Mr. Plumb was twice married. His first wife died in 1875. He was the father of twelve children, eight of whom still survive him.

REV. A. L. MCCLELLAND, Milton, Wis.

The sudden death of our faithful, energetic and time-honored life member, Mr. J. C. Plumb, again reminds us that the older workers among us are surely passing away. When I learned of his death at once my thoughts went back three months to his letter to me in response to an invitation I sent him, asking him to meet with us—with other veterans I had invited—and read a paper on some subject he might choose. He at once accepted, saying: "I have for some years thought of writing something on the origin and history of our best Wisconsin seedlings, and this winter I feel that with the cares of a busy life and the weight of three score and ten years resting heavily on me, that if I ever present that paper for publication, I had better do it at our coming meeting." His many friends who did not hear it read will be anxious to see it in print.

Mr. Plumb was a great writer, and with all his pressing duties at home was always ready to write to those who were asking for information, giving them his best thoughts. Since Uncle Peter Peffer passed away, I have always referred questions on naming varieties to Mr. Plumb, and have felt that when he could not do it so he was certain what it was, there was little use to ask any one else. I have been impressed for years that no member in our society had traveled more miles or had worked harder to gain information on the geological formation of our state in connection with apple growing, than J. C. Plumb, and I believe no member was better posted on that subject than he.

As a Christian gentleman, as a man with an excellent character, as an earnest worker, an upright honest citizen, a man of good habits—in short, what the world terms a clean man—the men that would excel J. C. Plumb are very scarce. But he has gone, and his works and example will be a monument to his memory.—A. J. PHILLIPS, Sec'y. Wisconsin State Horticultural Society.

Mr. J. C. Plumb at the time of his death had been an honorary life member of this society for fifteen years. On the fifteenth day of January, 1884, at the annual meeting, as the record goes, "upon motion of Mr. Peter M. Gideon, it was voted to make Mr. Plumb an honorary life member of this society in consideration of his long and useful service in western horticulture." That tells the story concisely of the position he then occupied in the esteem of his fraternity. Fifteen years have gone since that event, and each passing year has found him more secure in this position.

In this great loss to the Wisconsin Society and its members, we share and carry with them a common grief and mourn a common bereavement. His name will ever be associated not alone with Wisconsin, but with *northwestern* horticulture.

SEC'Y.

MICE INJURING APPLE TREES.—W. W.: Probably most of the apple trees in your orchard can be saved by covering the injured portions with grafting wax and then banking up around the base so that the top of the soil will be an inch or two above the top of the injury. Keep this banked up the entire season, and in many cases your trees will recover. If the bark is removed all the way around, it will probably pay best to take out the trees and put in new ones. It is not likely that such will fully recover.

GEORGIA'S PEACH LOSS.—The warmer weather throughout the peach-growing sections of Georgia has served to intensify rather than diminish evidences of damage. It is now everywhere agreed that the cold wave practically destroyed the peach crop of '99. All testify along this line. The trees are rapidly putting on leaves, but as a rule no blooms are in sight.

NUTS FOR PLANTING.—Gather the nuts (walnuts, hickory nuts, hazelnuts, pits of peaches, etc.), place in a rough bag and bury in the garden about a foot deep. By the time the frost is well out of the ground in the spring the shells will have burst and the nuts can be placed in a bed especially prepared for them or put where the trees are to stand.

Calendar for April.

O. M. LORD, MINNESOTA CITY.

The snow at this date, March 27th, probably averages six inches in depth all over southern Minnesota, indicating a rush of work for April, and the weather prophets predict a very wet month. Both these conditions affect materially our problems of work, but a wet or backward spring is not necessarily fatal to the production of fruits, especially those indigenous here, or those that are adapted to our climate. If the weather is favorable at the time of pollenizing, we may confidently expect a crop, other conditions being favorable.

Most fruit growers conclude that drouth has more to do in the destruction of fruit than any other climatic condition; so that if moisture is secured and held, we may hope for success. The question then is how to hold it to the best advantage. Shallow cultivation and mulching are the best means we can use.

It is not best to disturb the mulching on the strawberries until the plants begin to grow and show signs of wanting sunlight, unless plants are wanted for setting, when all the mulching should be removed as soon the ground does not freeze at night. Early set strawberry plants make the best growth during the whole season, as a rule. If the ground has been kept clean and properly mulched in the fall, nothing is gained by spring cultivation. But cultivation of bush berries is an absolute necessity, and this should be continued till the fruit is well set, especially after a rain. Red raspberry canes should be cut back, taking off at least one-third of last year's growth. This is most convenient after the leaves have started, so that all injured or undesirable canes may be removed. The past winter has been severe on all tender varieties of fruit. Unprotected blackberries are probably killed. If April should prove to be wet, protected blackberries may suffer from rotting of the buds, if uncovering is delayed too long.

Native plums should be grafted before the buds start, or as soon as freezing nights are over. Scions are best if cut a day or two before using. The trees may be safely transplanted, even after the leaves have formed.

Grapes also need attention as early as possible, especially the cuttings. If the cuttings have a short portion of the two-year-old wood left on in transplanting and are put where they are designed to stand, they will probably come into bearing sooner than the ordinary cutting transplanted.

Wood ashes are very desirable to apply on all our fruit plants, except where the soil contains alkali. Though not always necessary to incorporate them with the soil, they appear to do the plants

the most good when cultivated in, as the potash is then more or less dissolved and assimilated by the small roots. The rains will of course, wash the potash into the soil, where it is never lost till taken up by the growth of vegetable matter, and if the ashes are incorporated with the soil they are not so liable to be washed away or carried out of reach of the plants.

In gardening the earliest productions are the most heartily enjoyed and most eagerly looked for. Some varieties, like peas, onions, asparagus, etc., need early attention, but plants of a tropical nature do best when the ground has become thoroughly warmed.

Too much attention cannot be given at this time to the quality and character of the seeds to be used. If the seeds are worthless, we labor in vain and are doomed to disappointment. Next to care in the selection of seeds, comes a proper selection of varieties, adapted to our soil and conditions. In many cases this can only be determined by trial and especially so with fruits, as most vegetables are liable to adapt themselves to different soils when in the proper condition. A safe rule to follow is to select such as are known to succeed in the vicinity or neighborhood. A word of caution may not be out of place here in regard to a heavy outlay or investment in untried productions, which may be staples in a more favorable climate. Of the soil we have no fear, but reason and common sense dictates to us not to try dates, figs and pineapples, and prudence requires us to go slow on even some of the productions of temperate regions, like prunes, quinces, sugar beets, etc.

COMMON SENSE PRUNING.—The principles of pruning, as I hold them, are to head rather low, to have a central stem, with branches that come out evenly and continuously, to allow no large limbs to cross each other or otherwise interfere. Train to a round, evenly balanced head. Great care should be used to know the habit of each variety, those which are of upright habit being headed lower and cut back on top to prevent too tall growth, and those of drooping or spreading habit being treated exactly the reverse. Do not cut off all the twigs along the main branches, for they are needed to shade them and sometimes bear considerable good fruit, especially in case of the peach. No stumps should be left, but the cuts made exactly at the crotches. It has been proved by careful experiments that it does not pay to cover small wounds with anything to protect them from the weather while they are healing. Large wounds, such as are over an inch in diameter, should be covered with any common paint, which is cheap and as good as wax or anything else for this purpose. If these ideas are reasonably well followed there will be little or no need to secure the advice of an expert to show any sensible man how to do the work well.—H. E. VAN DEMÁN.

FRUIT FOR PARIS EXPOSITION.—The Western New York Horticultural Society is making plans to exhibit a carload of fruit at the big show next year.

Secretary's Corner.

PORTRAIT OF J. C. PLUMB.—The excellent plate used as frontispiece in this number came to us through the courtesy of the "Wisconsin Horticulturist."

SEND IN FRUIT REPORTS.—The fruit growers are requested to send by April 15th brief reports of the condition of orchards and fruit gardens, from which to prepare a summary for the May number. Address the secretary.

WHAT WILL THE HARVEST BE?—Advices received during the month as to the condition and prospects of Minnesota fruits indicate no change from what was said of the situation in the March Corner. Winter "still lingers in the lap of spring," and until she gets over it, and things begin to grow, nothing more definite can be known. The prospect is, however, generally thought to be good, and the injury inconsiderable to hardy trees and plants and small fruits reasonably protected.

CALENDAR FOR 1899.—Mr. O. M. Lord, of Minnesota City, has kindly consented to edit the calendar for the current year. His long and varied experience in different branches of horticulture in the northwest fits him for this work, and the society is very fortunate to secure his assistance.

It will be remembered that Mr. Lord has been representing horticulture with the Farmer's Institute this winter, and he will probably be with the institute corps again during the summer season.

TO ENCOURAGE GROWING SEEDLINGS.—"The Southern Minnesota Horticultural Society has adopted the following plan to aid in the development of the coming apple. Each member who may wish to try his luck, is provided with ten one-year old seedling apple trees, annually, and the society hopes to offer liberal premiums for the best apples raised from these seedlings.

The seedlings will be from seed of best and hardiest Minnesota grown varieties. R. PARKHILL, Sec'y."

WINTER EFFECTS AT SLEEPY EYE.—"My foreign plums are all winter-killed. The Early Red and Long Blue bore plums last year. The Minnesota, from Sweden, is dead. I got scions of a Bohemian prune last spring from Wisconsin, said to be hardy. The whole grafted part is dead. The Illinois Ironclad is dead also. The Schaffer raspberries are killed to the ground. Turner, Ohio and Gregg raspberries are in fair condition. I top-worked a number of apple trees last spring. I think all are in good condition."

MARTIN PENNING.

MEADOW VALE HORTICULTURAL CLUB.—This enterprising local society, of Elk River, has reported fifteen members, Erastus Morgan, president; A. W. Keays, secretary; and they have notified of their intention of sending a delegate to our next meeting. Although

small in numbers the society is an active one, have papers read at their meetings, and have quite a sum in cash offered for premiums for exhibits of fruit.

They are also doing considerable in the way of experimenting, and are to increase this branch of their work this spring by the addition of some 800 trees and plants.

GOING BACK TO THE FARM.—At the commencement, March 24th, of the School of Agriculture, the editor had the pleasure of seeing three young women and thirty young men graduate. It is inspiring to be present on such an occasion and renew again the scenes of youth.

This school is taxed to its utmost to care for all those who are knocking for admission within its doors. The horticultural department is especially crowded, students being refused admission to the classes for lack of room for an additional chair in the classroom. "Packed like sardines in a box" fully describes the situation there

ANNUAL MEETING OF THE AMERICAN POMOLOGICAL SOCIETY.—In the ever interesting city of Philadelphia the American Pomological Society will hold its 25th biennial session, September 7-8. Interest in horticultural matters seems more pronounced than usual, and the coming gathering in the spacious halls of Pennsylvania's horticultural society will be an important event. Ten state horticultural societies have already selected delegates to the meeting, and there is promise of a large exhibit. By sending $2 to the treasurer, Prof. L. R. Taft, Agricultural College, Michigan, any one interested in horticulture may become a member. Details of the meeting may be obtained by applying to Secretary William A. Taylor, 55 Q street N. E., Washington, D. C.

GO THOU AND DO LIKEWISE.—One of our members, and not an old one either, Francis Davis, of Goodhue, has sent in at different times this year three, six and five new members respectively, in all so far fourteen members, and he promises more when the roads improve so that he can get around. His plan is a simple one. Besides what the society gives new members, namely: cloth-bound report, the magazine for the year and three plant premiums, he gives his own premium of the "Amateur Fruit Growing," which makes an irresistible combination. If each one of the 800 members on our roll would do a similar work for the society, a little mathematics would show an astonishing result. There are a few who could not, and there are others who we fear will not. Perhaps the reader does not belong to either of these classes and takes a vital interest in the work of the society.

Try your neighbor on this plan and report to the secretary.

A NEW AND USEFUL PLANT.—"Having made what I believe to be an important discovery for the horticultural work of South Florida, will report the same to you—in hopes that it may be applicable to Minnesota fruit culture, and so benefit you and the Minnesota State Horticultural Society, of which I am still a member and devoted

admirer. We settled at Harbor View about five years ago, and at that time Judge DeCoster lived about a half mile from us, and had a yard of about an acre in extent surrounding his house that was literally swamped in with to him (and neighbors) an unknown plant, from two to eight feet high. He said he had been on the place some thirty years—but did not know when or how the plant get there. I sent a plant in bloom to the Division of Botany at Washington. They said it was Senna coffee and not poisonous—but lacked the alkaloid principle found in common coffee. I have drank it now about three months—hoping it might act as an antidote to malaria, that I had been troubled with—but can't say much yet about that, only that I have been free from it ever since. I prefer it to Java coffee—*because* it is not *stimulating*—and I can drink it as I would so much water, without fear of bad results. But to me its principal importance consists in its great value as a nitrogenous plant. DeCoster gets double the fruit where his trees are crowded with this plant. I have sown an acre with it—in my orchard, and shall not plow or cultivate to disturb this old friend. It is an annual, and I have it in bearing, and will inclose a trifle of seed for you to test and report on."

A. W. SIAS, Harbor View, Fla."

LEGISLATION IN PROGRESS APRIL 5.—1. Our printing appropriation. The bill providing for this passed the house a few days since without an opposing vote, but was cut down to 3,000 volumes per annum. This change will not cripple our work, as at present conducted. The bill is in the senate now on general orders. That body has a long list ahead of this, and the end of the session is not far off.

2. The San José Scale bill. Shorn of its bond and license features it was reported by the forestry committee and is on "general orders" in the house. With a still further radical amendment, which is assured, we understand, there is some prospect it may pass the house and take its chances in the senate with a host of other measures on the closing days of the session. As amended it will permit but not oblige nurseries to be inspected; will require nursery stock coming into the state to have been inspected; no certificate will be required to ship nursery stock by rail; the state inspector may adopt necessary measures to destroy the insect wherever found; fines are provided for violation of the law. In this form the law will seek to keep the insect out of the state and kill it if found within.

LATER.—This bill has been killed in the house.

3. *The forest reserve law.* It has passed the house and is in committee in the senate with fair prospects of passage. As this bill creates a "Forestry Board," an appropriation is made in connection with it instead of the usual one to the Forestry Association, as we understand. The bill is almost verbatim as printed in our report of two years since, except that it provides no future income for the heirs of donors of forests to the state from the sale of the products of the land—as the writer remembers it.

BEFORE PLANTING.

AFTER PLANTING.

SOME OF THE WORK OF THE MINNEAPOLIS PARK COMMISSION.

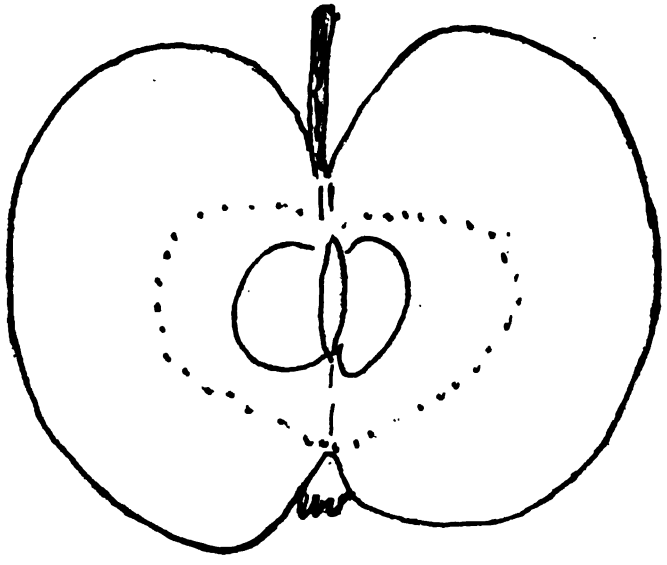
THE MINNESOTA HORTICULTURIST.

VOL. 27. MAY, 1899. No. 5.

MORE RECENT MINNESOTA APPLE SEEDLINGS OF VALUE.

J. S. HARRIS, LA CRESCENT.

In all the 500 or more seedling varieties of apples of Minnesota origin shown at the late state fair, which were the cream of at least 2,000 varieties that have fruited in the past season, it is not at all unlikely that there are a score or more having peculiar merits that will make them valuable additions to our pomology. The five minutes alloted to this paper will allow the mention of but few of them and the doing of justice to none of them.



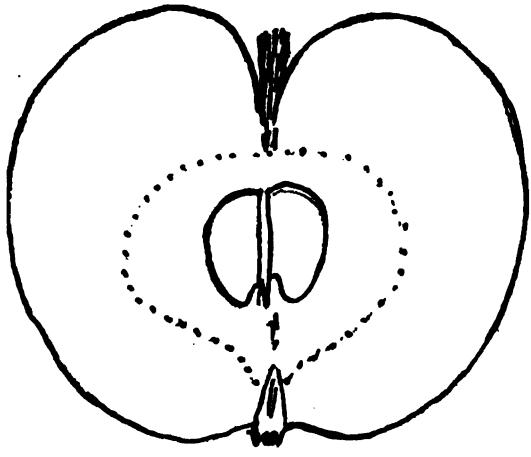
NELSON SEEDLING.

FIG. 1. *Description.*—Size, 5½ to 7; weight, 5 to 7 ounces; form, roundish oblate, slightly conical; color, greenish yellow and red, striped with numerous gray dots over the surface; stalk, long, slender and elastic; cavity, regular, broad and deep; calyx, open, broad, shallow, wrinkled; flesh, white, half fine, tender; flavor, pleasant acid, inclining to sub-acid, good; season, a little later than Duchess, or late August and early September.

Samples for testing were furnished by R. C. Livingston, Spring Valley, and are from the original tree.

The Nelson. The Nelson is a chance seedling, grown in the spring of 1877, at Spring Valley, Fillmore county, by Andrew Nelson. The tree is handsome, a thrifty grower and free fruiter and apparently hardy, as it has stood the test of our Minnesota winters since 1877 without harm to but one branch and so far has been absolutely free from blight. The fruit is about the size of the Duchess of Oldenburg, ripens at about the same time or just a little later, of far better quality, and this year kept in good condition two weeks later. (See outline and description Fig. 1). This variety is being propagated in the nurseries of Fillmore county, and will not be allowed to be cornered. Trees and scions can be secured at most reasonable prices.

The Holt. The Holt had its origin at or near St. Charles, Winona county, some twenty-five years since. Of its early history I have no knowledge. It was propagated by Wm. McHenry, of St. Charles, to some extent, some fifteen to twenty years since, but probably not



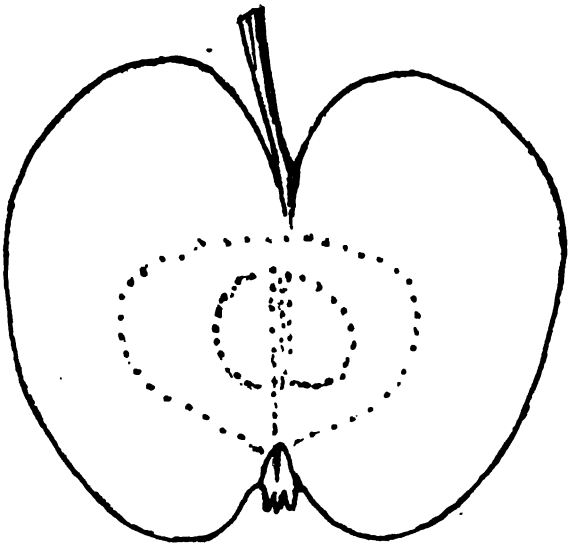
HOLT.

FIG. 2. *Description.*—Size, 4 to 5; weight, 4½ ounces; form, round; color, yellowish green, changing to light yellow when fully ripe, with a brownish blush cheek on sun side, and often showing one to three brown russet lines extending from base toward the eye; stem, short and stout in a medium regular russetted cavity; calyx, small, closed, in a medium shallow ribbed or wrinkled basin; flesh, yellowish, tender, juicy; flavor, rich sub-acid, good; season, early September.

very much distributed. The only place I have seen it fruiting is in the orchards of O. M. Lord, at Minnesota City. As that is a very trying situation for successful orcharding, I am very favorably impressed with the behavior of the tree. I have visited it and seen it in fruit each of the last seven years. The tree is a moderately vigerous, symmetrical grower, a regular annual bearer and stands well where varieties around it blight badly, and makes a good, annual growth at the same time it is perfecting a crop of fruit. The fruit is of medium size, smooth, of fine appearance and excellent quality; use, desert; season, early September.

Lord's Seedling L. The "Seedling L" is a seedling of the Wealthy, by O. M. Lord, of Minnesota City. The tree is a fairly strong grower, of very good habit and an early fruiter, less subject to blight than its parent, the Wealthy. The fruit is of full medium size, good form and attractive appearance; season, probably early winter.

T. Johnson No. 6., or Norse. This is a variety of considerable merit that I have been watching closely for the past five or six years. The tree is about thirty-five years old and was grown from seed brought over from Norway and planted by a Mr. Tobias Johnson, in Houston county, where it now stands. It does not show signs of ever having received any injury from severe winters or any other cause. The tree is headed low and has a rather broad spreading habit, the head being over thirty feet across. The originator and his wife having deceased a few years since, I am unable to learn at what age it began to bear fruit but think that it was an early bearer.



LORD'S SEEDLING L.

FIG. 3. *Description.*—Size, 5; weight, 6 ounces; form, round ovate, conical; color, yellowish ground, nearly covered with bright pinkish red; stalk, long, in a medium narrow, deep, greenish cavity; calyx, closed in an abrupt, narrow, deep, ribbed basin; flesh, white, often slightly stained with pink, fine ground, juicy; flesh, pleasant acid flavor; core, small and closed; season, winter.

It now produces some fruit annually and produces heavily on alternate years. I should estimate that the crop this year would measure twenty-five bushels. In 1896, twenty-four bushels were sold from the tree, netting the owner $14.50. The fruit is always fair, of about medium size, smooth, round, conical form, greenish yellow and red striped and thickly sprinkled over with large whitish dots, and if allowed to hang until fully ripe, is covered with a bluish bloom. The cavity is narrow and deep; stalk, medium long, with calix closed, in a shallow, wrinkled basin; core, small and closed. The flesh is nearly fine grained, yellowish white, sometimes stained with red; flavor, pleasant sprightly acid; season, late autumn.

The Molly, of W. L. Parker. This variety is of unknown origin. It appeared simultaneously in the orchards of W. L. Parker, of Castle Rock, and the late Barnett Taylor, of Faribault. The latter believed it to be a sprout from the Wealthy, as he was positive it sprung from a Wealthy scion cut and set by himself. The tree has about the same vigor of growth as the Wealthy and appears to be even more hardy, bears well but is not as prolific a bearer as the Wealthy. The fruit is of about medium size, specimens weighing about five ounces. The form is roundish, angular and slightly ridged; color, when mature, yellow, shaded with a brown blush on the sun side. It has a short stem, in medium deep, irregular, russetted cavity, and a small closed calyx in a medium deep, ribbed basin. The flesh is light yellow, fine grained, firm; flavor, sub-acid, good; season, December to March.

The President: Mr. O. M. Lord has a very fine specimen of the Holt, and he thinks very much of the tree.

Mr. Yahnke: We had it at our fair, and it is a very nice tasting apple; it has almost a pear taste.

Mr. R. H. L. Jewett: It might be of interest and profit to some of us if Mr. Harris would tell us where these seedlings could be obtained.

Mr. Harris: Mr. Lord will probably furnish cions to any one that wants them for grafting. It is barely possible I might have more trees in the nursery than I want.

Mr. Jewett: Is the Catharine a good apple?

Mr. Harris: The Catherine stands in Houston county and has brought its owner an immense amount of money. Two years ago he took one single load of thirty bushels to LaCrosse and piled them up in a window, and they were all sold in a short time.

Mr. Jewett: Where can we obtain stock?

Mr. Harris: I can furnish cions. The owner's name is Klein.

Mr. Reeves: While Mr. Harris was mentioning those new varieties I was just thinking while we are hunting new varieties what is the use in neglecting those we can grow. The Jonathan and the Winter Winesap can both be grown if we give them the proper attention; we need not neglect them. I top-work them because they have a poor root. If they die in a hard winter try them again.

Mr. Patten: Fearing that Mr. Reeves' recommendation of the Jonathan as a top-worked tree might not do for general cultivation, I wish to say that it is very likely that apple would be a success top-worked in the eastern portion of the state along the hill region, where this apple has developed as nicely as it has. If any one undertakes to top-work the Jonathan in the prairie country of Min-

nesota he had better do it with a great deal of care, and not recommend it until sure it will endure. I am not so sure that the Winesap will not endure. I believe that is a winter apple that has been overlooked in northern Iowa for this top-working. In our search for new varieties we have undoubtedly overlooked some of the most valuable things we have. I have often thought we have almost forgotten that old Fameuse, or Snow, apple, that is so popular in southeastern Minnesota—and we have others equally as valuable.

Mr. C. L. Smith: In traveling over the southeastern part of Minnesota it is not uncommon at all to find the Fameuse in bearing, trees that were planted twenty-five to thirty-five years ago, and they are still alive and bearing well. We still find some in Fillmore, Houston, Olmsted, and, sometimes, in Mower county, and in Faribault county there are some that have been planted thirty years.

Mr. Hartwell, (Ill.): I am a baby in this line of work, having had little or no experience. In regard to this matter of grafting a tree on its own roots, I saw a statement printed that it was best to use a long cion. I would like to know how many are practicing that in this state, and what is thought of it.

Mr. Ditus Day: I would like to say about the Fameuse, that I have a number of trees that are bearing today, some of them very heavily, and those trees were planted in the seventies somewhere. I do not know whether you would call them old trees or not. They killed down to the ground and came up from the sprouts. They were killed in 1885, and all the trees I have are sprouts.

Mr. Harris: I do not know of any trees of the Fameuse in our section but what have come up since the year 1885. While the Fameuse was injured once before during the fifty years I have been in the west, it demonstrated its ability to recover from severe injuries. The crop of the Fameuse in 1884 was very large. I sent apples all over the state, some of the finest Fameuse I ever saw, and I could have sold any quantity of trees.

The question our brother from Illinois raised I will only answer for myself individually. I use a little longer root than a great many do and a short cion. When cions are a little scarce one bud is enough for me. I believe I can get as well rooted a tree as any man that ever raised a tree. I believe I can give him as good a tree with a short cion and a medium long root as he can get anywhere. I will tell you why I practice that. There are a great many varieties of apples on which the roots only come out of the body, and which are not good, strong, substantial growing roots. You take a body like that, and it will be a good many years before the tree can stand alone or walk without a cane. There are a good many that will not make a good union about the graft, while the Transcendent and others will do it. Most of the large nurserymen practice the reverse of what I do.

Mr. Hartwell: A man told me he lost a large share of his nursery stock one winter, and the trees he found alive had a decayed root at the bottom and a live root above. If that is universally true, there is no question about this matter. All the surviving trees had a dead root at the bottom, while the roots on the cion were alive.

Mr. Barnes (Wisconsin): I would like to answer Mr. Hartwell's question, and though we are not in a convention of nurserymen we may be able to throw some light on this subject. The trying season of four years ago killed some 80,000 trees for me, and in digging them up, I found some of those trees were in fair condition, and invariably those trees had commenced to grow roots from the cions. I plant cions five or six inches long, I plant them deep, and I grow roots from almost every single cion in the nursery. I am not advertising my success, but brother Philips can tell you all about it. I want no other practice or system on my place. I believe it is the successful way to grow nursery trees.

Mr. Phillips: In regard to what Mr. Barnes says: I looked at his trees, and I asked him to bring a bunch of those trees to this meeting. He has nice soil to grow trees in, and he had a half dozen or more in a bunch with the finest roots I ever saw. I think the point is right here—and there are no people in the world that thresh over old straw like horticulturists. Mr. Smith got up here in this building and said he had traveled all over this state and Wisconsin, and the best trees he knew of in either state were trees where a long cion was used on roots one and one-half inches long. We are a little cranky about the Virginia crab. Somebody said I had discarded it; that is not so. I know of twenty-five Virginia crabs where the roots that are supporting the tree are all above the original root The original cion is supporting the tree today.

Mr. C. L. Smith: About the Virginia crab: I had a few root-grafts that were overlooked on the place, and I took them up and set them out in the spring on a dry ridge. I had some trees on their own roots, and every one of those seedlings froze out dead the first winter. The Virginia crab roots readily from cuttings, and they were all on their own roots, and those Virginias were all alive. There were a few Duchess, a few Wealthy, a few Transparent and some Whitney that came through, but most of them did not make roots enough from the cuttings to get through. The Whitney did, and the Siberian will do it. I know from experience that the short root and long cion of hardy varieties will not root-kill during our dry winters, and I am satisfied that more of our trees die from root-killing than from any other one cause.

Mr. Hartwell: I will state another point this same man told me. It was his impression that a tree that had crab blood in it would fruit more easily than any other.

Mr. Dartt: In regard to killing out of trees, I can relate something of my own sad experience. A good many years ago I had 800 fine Wealthy trees; they had just come into bearing, and some trees had produced a bushel of fruit. It was just before the hard winter of 1884-5, and nearly every one of those trees went down to the ground from the effects of that winter. I thought I did not want a tree that would kill down, and I went to work and grubbed out most of them and replaced with Duchess. A few of them were left and sprouted from the root, and those trees soon commenced bearing and have borne ever since, and I am satisfied that I lost more than $2,000 by grubbing out those old Wealthy stumps. The same rule

and principle should be applied to all other hardy varieties. If you have trees of which the fruit is of good quality and good reputation that kill down, do not grub them out, but allow them to sprout from the ground, and in a few years they will be all right. I had the Fameuse and the Tallman Sweet; they would not stand our climate and I grubbed them out; now I have got no Fameuse and no Tallman Sweet. Perhaps I have said enough, although I want to perpetuate the testimony that has been given in favor of the short root and long cion. The cions are generally from hardy trees. If you get a root from a hardy cion you will get a hardy tree.

Mr. C. L. Smith: I have just a word more to say. In thirty-five years there have been only two winters in which those varieties were killed down, and that frightened people, and they stopped planting. Only twice in thirty-five years that we had a general killing of trees.

Mr. Dartt: The gentleman said those hardy varieties would not root-kill. My experience is that in root-killing time it takes everything, killing sometimes crabs and everything else. In the nursery at the Owatonna station none escaped. It proved to be a root-killing season, and one variety did not seem to stand any better than another.

THE ANTHRACNOSE—A TALK.

Prof. S. B. Green: I would like to say a word about the treatment of anthracnose. It is a disease that can be overcome. We are liable to have years when anthracnose is very severe, and then again it disappears. We are not as liable to it here as they are in New England, New York and Ohio; it is far worse there than it is here. In fact, I think it is a simple matter to keep it out of our raspberry patches here. I have been experimenting along that line for six or seven years, and I find in a general way the following plan strikes me as the most favorable, and I think will be found very successful in general practice: When you lift the canes in the spring of the year treat with Bordeaux mixture; make it double strength, make it pretty thick, and cover the canes with it soon after they are lifted. When the young growth appears and is about eight inches high, spray again, but use the mixture weak, just half the strength you did before. The theory is this: The spores are thrown off by the canes early in the spring from these infected spots, and when they are covered by a thick Bordeaux mixture it prevents those spores being thrown off. You cannot prevent injury to the old canes, but you can prevent injury to the young canes, and if you spray you can make the young canes grow well the first season without any serious damage—but spray the second time when the young canes are about eight inches high. We tried it last year and for a number of years previously, and we found the treatment very successful.

Mr. Yahnke: Would you apply it the same way to the red raspberry, or does that apply only to the black?

Prof. Green: Yes, apply it to the red in the same way if you have anthracnose. I would apply to the red just as well as the black, but you do not have so much on the red.

APPLE SEEDLINGS OF MERIT IN NORTHERN IOWA.

CLARENCE WEDGE, ALBERT LEA.

Northern Iowa has been a prolific field of experiment in apple seedlings, as well as in top-working and other effort to secure hardiness and quality in orchard fruits, and from the nature of the climate and soil and the varieties from which seed is likely to be taken, we think this section far more likely to originate varieties suited to our use than any region east of us. Indeed, as the climate of Iowa differs from our own only in degree, they are working at a problem under the same case and rules as ourselves, we, being in the advanced class, having, of course, the hardest example given us. The influence of the horticultural societies, as at present organized, will, also, in the future do much to encourage the production and dissemination of the hardier fruits, as the influence of the two northern Iowa societies rather preponderates in the state society, and compels a very large consideration of such varieties as are well adapted to southern Minnesota. A very different state of things exists in Wisconsin, where the influence of the southern, lake shore and other favorably located regions entirely governs the state society, and where, indeed, the climate is generally modified by large bodies of water and immense forest areas.

Foremost among the seedling producers of Iowa stands Mr. C. G. Patten, of Charles City, who, from what might be called his first crop of seedlings, has given us such promising kinds as the Patten, Iowa Beauty, and Duchess No. 6. The first named can no longer be regarded as a seedling, as it has taken its place upon the regular propagating and catalogue list of all our northern nurseries and is too well known to need description or comment. The Iowa Beauty, a seedling of the English Golden Russet, is not as well known among us as perhaps it should be. We have fruited it in a small way for several years, and it is about the largest and handsomest apple we grow, of good dessert quality, keeping perhaps a month longer than the Duchess. It is a remarkably fine nursery tree, has been grown to salable size here in Minnesota in two years, and at three years would run above rather than below the standard five to six feet. J. C. Ferris, of Hampton, one of the oldest nurserymen of northern Iowa, regards this as the best of Mr. Patten's seedlings.

The Arthur is a variety originated near Charles City and introduced by Mr. Patten. A medium sized fruit, of regular oval form, prettily striped, firm flesh, fair quality, keeping till February. We have been much impressed with the early maturity and hardy appearance of this tree, and considering the excellent keeping of the fruit, think it a safe and valuable variety for our state.

Duchess No. 6 is all the name Mr. Patten has yet vouchsafed to a very nice dessert apple of about the season of its parent. Its lack of color would deprive it of a place on the market, but its good bearing habit, apparent hardiness and quality that pleases all tastes, would make it desirable in the home orchard.

In describing the following varieties, we copy from a letter lately received from Mr. Patten. "For a sweet apple from November to

January the most promising of anything I know is my seedling of Ben Davis. Fine grower, very hardy to appearance, a steady bearer, and a good fruit of good size, no doubt the product of a cross with Tallman Sweet. I have still another sweet seedling of which the Duchess is a grandparent and the Tallman the first cross. It will keep, and its quality is excellent. Of Brilliant, my seedling of Fameuse, the United States Pomologist at Washington writes: 'Superior to its parent in every respect.' It is a third larger, hangs well to the tree, and I have always regarded it ten to fifteen per cent hardier than Fameuse. It also makes stronger forks and is free from blight."

Mr. Mitchell, of Cresco, Iowa, in a particularly trying situation, has originated several seedlings of value. His Red Warrior is a very smooth fruit of good size, beautifully colored, that keeps better than Wealthy. The tree is a prodigious bearer and of undeniable health and hardiness. For culinary use and on the market it would be first class; as a dessert apple it is not equal to the Wealthy. This variety has not had the trial in our state that its all around merits seem to call for. It scored 95 per cent at the Omaha Exposition and attracted much attention, as, indeed, its great beauty would command anywhere. A variety he calls No. 4 A. resembles the Duchess; fruit, sound November 17th.; tree, very prolific. Cresco is the name of another of his productions that should receive a share of our attention.

One of the most persistent workers in Iowa is G. A. Ivins, of Iowa Falls, who writes of his favorite seedling apple as follows: "My No. 2 is a fine, large apple of high color, and in quality for eating and cooking I have none on my grounds that will surpass it; in hardiness it will stand any winter that the Duchess will. It has Russian blood and like many of them is rather a slow grower in the nursery row. The apple in shape is nearly round, or what is called flat; season, October. I have several other varieties, but this is the best."

Kaump is a variety that was introduced at Odebolt, Iowa, about 1875, although we believe it originated in another state. It is similar to the Longfield in its habit of remarkably early and heavy bearing. The fruit is below medium in size and only fair in quality but keeps perhaps a month longer than Wealthy; not an extremely hardy sort, but one that makes quick returns, and as it keeps well would be of some value in the home orchard. It is very pretty in the nursery, where it grows as straight as an arrow and branches out as handsomely as could be desired.

FRUIT OUTLOOK IN WISCONSIN.—"I have just returned from a ten days trip in the northern part of the state. I find the tender varieties of apples, pears and cherries somewhat injured, but I can find no damage to the blossom buds of our hardy varieties of apples plums, cherries or pears. I look for very little injury here in the north, for the reason that wood was well ripened last fall. The ground was wet, and we have had plenty of snow all winter. The cold came gradually, and trees and animals were prepared for it. Unless damage is done from now on, I look for a fair crop of fruit."—A. J. Philips, Wisconsin.

BEST VARIETIES OF EVERGREENS FOR WINDBREAKS.

S. D. RICHARDSON, WINNEBAGO CITY.

What I shall say will have reference to the counties of Faribault and Martin, and as Minnesota is a big state with much variation in soil and climate, each one must judge for himself how far what I say will apply to his location.

We are in the prairie country southeast of the "Big Woods," subject to extremes of drouth and moisture and furious winds. I do not think that these extremes are any worse than they were thirty years ago; perhaps, not quite so bad. Our subsoil is usually a clay that is heavy and firm as long as it contains any moisture, but not so solid but what it is penetrated freely by roots of all kinds. In long continued drouth the upper part shrinks up into little round balls like fine gravel that can be shoveled quite easily. When this happens, woe to the evergreen that its owner does not water or that has not roots that have gone to a deeper level where there is moisture. I have noticed the behavior of our native red cedar under these conditions for many years, and while I used to think it was too slow a grower and did not amount to much, I have found that it is a good grower and is the least affected by drouth and wind of all the evergreens that I have tried.

The spruce comes next with power to resist wind and drouth. I recollect an instance in our own experience that happened some ten or twelve years ago that will illustrate this fact. We transplanted several thousand small Scotch pine, arbor vitæ, balsam fir, and spruce for the second time. We had a very dry season, and the result was that the most of the spruce lived and made a fair growth, and the most of the others died. So I will say in answer to the question asked: Best varieties of evergreens for shelter belt, native red cedar, spruce and Scotch pine. The white pine and red, or Norway, pine are worthless with us. They winter-kill. We have tried both thoroughly, for we wanted some on our premises, but failed.

Mr. Dartt: You say the native red cedar. What do you mean?

Mr. Richardson: I mean the northern grown cedar. I had occasion to buy red cedar from Illinois. All but two of them were failures.

Mr. Dartt: I will give you my experience with the red cedar. I started in growing evergreens on a small scale, and I bought red cedar three or four times and planted them and took care of them, but after three or four years I found that a portion of them were failing. The last of those I bought, I bought for the tree station; there were fifty or a hundred of them; I set them out, and they did just as the others did. They were said to be grown from northern seed, but they commenced dying, and as much as four-fifths were grubbed out, but there were some specimens among them that proved to be hardy and grew to be

large trees. My experience is that your pine tree of the market, at least a great many of them, will be too tender, and I came to the conclusion that with the red cedar, as with apple trees where we grow them from the seed, some of them would be hardy, and a great many of them would not be hardy. I believe it would be risky to plant red cedar, as we usually find it on the market; I do not believe it is safe; but I have heard of the native red cedar, finding them on bluffs and planting them near where they were grown, and I have never heard of their proving tender.

Mr. C. L. Smith: I tried buying red cedar ten to fifteen years until I thought they were no good. I finally saw some that were in very fine shape, and I asked the man where he got them. He told me where he had pulled them up, and I started out myself with the team and got some. They all grew. With my experience in planting I would rather have a thousand red cedars four to five inches high, pulled up in Scott county, Minnesota, and down along the Minnesota river, than ten thou sand from the state of Illinois.

Mr. Wedge: I have observed this matter of the red cedar with a great deal of care and study. I have somewhat the same experience as Mr. Richardson, and with the same parties. I have the native cedar from the Minnesota river; I have trees from the Black Hills, of South Dakota; I have trees from the deltas of the Platte river, and I also have some that I got from Hill. I have no doubt Mr. Hill (Dundee, Ill.,) sent them out in good faith, but those trees suffered very materially. I think Mr. Gardner could pick out the trees that were grown from northern seed. The vitality and hardiness of the trees inheres in the seed, and those trees from Minnesota, from our vast forests, in the fall turn a peculiarly deep, rich red. Those I got from Mr. Hill did not turn so deep a red. They are more of a silvery hue and do not turn the rich red that our northern trees do. The red cedar from the Black Hills is an entirely different tree, as well as most hardy. It never turns a real red, and if it does turn red it is all covered with a silvery sheen. In setting out on my place ornamental trees I would reserve a place for those trees from the Black Hills of bleak Dakota.

Mr. Gardner: Fifteen years ago or more I set out a row of red cedar eighty rods long which made a good windbreak, but the main idea in my mind was to have those trees to grow seed from. I think those trees are twenty feet high. My idea was to get a hundred bushels of seed from the larger ones, but from the time they were large enough, which was about seven years ago, I have not collected one peck of seed from the whole row, neither have I been able to get red cedar seed in this northern country.

Mr. Wedge: I have it in any quanty. There is no difficulty in getting the seed.

Mr. Gardner: In our whole section of country there has been no seed to amount to anything.

Mr. A. D. Leach: I have quite a large grove of red cedar on my place, and I have had considerable experience in setting it on my farm, and as my experience goes there is no tree that is easier set, transplanted and grown than the red cedar. I set out some twenty years ago a row of Lombardy poplars on the north and west side of my house, which trees are now about eighty feet high, and in the center between each two trees I set a red cedar at the same time. Every one of those red cedars are alive today, and at least twenty feet high, and they seem to thrive as well as they would if there were no poplars there at all. I have set out a great many cedars about the place and have never had any trouble to make them grow. The red cedar will do better on sand or gravel than it will on clay land; however, it does very well on clay. In a little cemetery near my place I set out box elders and red cedars. One side of it is clear sand, and on the sandy side the box elders were a failure. They have been there some fifteen years or more, and they are no larger around than my ankle, while the red cedars are fully as good on that side as on the other. The other side is a black loam with a black subsoil, and the cedars are just as good there as they are on the first side. Then I have a grove of red cedar on a point running into Lake Minnewashta. It is clear sand, and on that soil the red cedars thrive wonderfully well. If you have a piece of sandy soil on which you can grow nothing else set out some red cedar.

Mr. Ellergodt: I would like to ask if those cedars have limbs close enough to the ground to make a windbreak?

Mr. Leach: Yes, they do.

The President: There is one thought I want to bring out. There is a general complaint that white pine will not live, Scotch pine is not living, etc., and what is it that kills them? Is it not drouth, a lack of moisture? Did you have them planted so they would get the benefit of the water that fell, or did you have the earth mounded up, so all the water would run off?

Mr. Dartt: There was not water enough to run off. (Laughter).

Mr. Richardson: I had Scotch pine were the water ran off, and they died. I had Scotch pine where all the water ran on to them, and they died.

Mr. Pond: I do not think it can be a lack of water. At Minnehaha creek there is a cut eight feet down where they made a driveway, near which there is standing a Scotch pine. The roots of the tree is still living, so it cannot be a lack of moisture.

Mr. Patten, (Iowa): This matter of evergreens has been pretty well discussed, and the question as to the variety of red cedar and as to their northern or southern origin seems to have been thoroughly gone over, but while Mr. Wedge was speaking I was thinking that perhaps there was a point that had been overlooked by him, and others may have done the same thing. I believe it is true that a large proportion of evergreens along the Mississippi thirty-five to forty miles in the country have been taken from the banks of the Mississippi and from streams running into the Mississippi, whether

they are white pine or balsam fir. I have noticed this especially, that the balsam fir is abundant, and in many cases the white pine is a decided success. My opinion is that all those trees that are native to the country bordering on the Mississippi are very much better adapted to this country than those trees that are grown from northern seeds in this country. I believe if an effort was made to keep those seeds and plant them, you would have greater success. As to the red cedar, whether grown in the Platte Valley or grown in southern Illinois, there is not much difference between them and those grown from the seeds in the northern portion of the state.

Prof. Hays: I think there is a very valuable point in this matter of handling forest trees. Two years ago I was in Canada with Prof. Saunders, and he showed me a number of elms and other varieties of forest trees that were grown from seeds nearly or quite as far north as that country, and also trees grown from seed brought from every section of the country. They are very distinct varieties in the matter of hardiness, because they had been grown in many cases for many generations where they could survive only if they were hardy. Nurserymen, I believe, should not only take pride in telling where their stock is grown, but they should complain of each other for not doing that, and patrons should clearly understand where seeds come from. It is a matter of vital importance to get that matter straightened out so hardy things will be used.

Mr. Dartt: I would like to ask the professor whether some individuals of the red cedar are less hardy than other individuals?

Prof. Hays: No doubt, those that come from seeds from trees grown south. Take the individual red cedar of Minnesota, and I have not the least doubt in the world that the trees vary from the seed produced from such trees. I might illustrate. We find a great variation in all of the field crops. For instance, take the plants of wheat. We plant a plat of ground with wheat and pick out the ten best plants and get other variations. These sometimes will be cross-fertilized, and there cannot help being variations.

Mr. Dartt: If variation makes that difference, is the white spruce and Norway spruce a variation?

Prof. Hays: It is only a variation; originally in the evolution there was little difference. I am a great believer in the problems that Charles Darwin worked out, and when I see such great variation in plants I cannot help but conclude that there will be immense variation if a large variety of more different types are brought together. Suppose we bring trees from the north and put them near trees from the south, it may be the same kind, blood lines are so divergent that there will be great variation.

HEADS NEED THINNING.—The chief defect in many orchards is too much wood. The heads are so dense that light and air cannot get to the interior. As a result the fruit is borne upon the ends of the outer branches. The yield is reduced and the quality inferior. Do not prune severely but cut out interfering branches, so that all parts of the tree can get air and sunlight.

OLD FAVORITES AMONG STRAWBERRIES.

C. A. SARGENT, RED WING.

There are so many here that know more than I do about strawberries that it seems out of place for me to say anything on this subject, and I don't know as I can tell you anything new or that you did not know before. But we sometimes profit by having things repeated and brought to our notice that we knew before. It is not always what we know, but what we do that counts.

Strawberries are one of the most delicious fruits that we have and the more appreciated because they are the first to ripen after we have been without fresh fruit so long. Among the old varieties the Wilson is one of the oldest that I remember about. It has been one of the old stand-bys, but is losing its vigor with most growers and has become unprofitable. But I think it has been abused like other varieties by not being particular enough in taking up plants to transplant, sometimes taking plants from between the rows, thus getting the weakest plants. I remember the first plants I set out I took from an old bed and from between the rows, so as not to spoil the old row, and I suppose this has often been done. No wonder they run out. If we want to raise a good cow we don't take the poorest and weakest calf to raise it from and then become surprised because she don't make a good cow. I believe if we are careful in selecting plants the varieties will not run out nearly as soon. The Wilson is a very firm berry, nice to handle, and I couldn't give it up until after repeated failures. Last spring I sent and got fifty plants from a man that claimed he had the Wilson with its old time vigor. These plants grew very nicely, and this fall looked as though they were going to meet my expectation. They surely made plenty of plants, which has been the principal fault with that variety, and I shall watch them next summer with a great deal of interest, and if they do well shall think I have struck a bonanza.

The Crescent is another of the old varieties which has been very productive and are so now with some growers, but I have discarded it. It is quite soft and with me, gets small after a few pickings.

The Warfield, though not one of the oldest, has been raised quite a while. It is the best strawberry I ever raised. If it were a staminate, I would not want any of the other varieties that I have tried. As one of my customers expressed it, it looks as though it had been varnished, it is so bright and attractive looking. The quality is as good as the looks; it has good size and holds it until the very last. They are extra good plant makers and are liable to get too thick if planted close. I think two feet is close enough to set them in an average year. They have one fault of remaining green on the under side after they have turned red on the upper side at the first picking.

Michael's Early is quite an old berry. Though I don't know as it ever was an "old favorite;" it is a good fertilizer but not productive. It is a good plant maker, and as one has expressed it, "is good to raise plants to give away."

Capt. Jack is a good, firm berry, but not very productive and winter-kills sometimes badly.

The Monarch, I think, is the same as Capt. Jack.

Bederwood, though not an old berry, is very productive, rather soft, of light color and a good fertilizer for the Warfield.

Of all the berries that I have tried, the Warfield is the best pistillate and the Bederwood the best staminate.

Mr. C. W. Sampson: Did I understand you to say the Warfield is the best pistillate?

Mr. Sargent: Yes, it did the best with me; the best I ever tried.

Mr. J. L. Hartwell, (Ill.): The gentleman spoke of the Capt. Jack killing. Does it kill if mulched very thoroughly?

Mr. Sargent: We do mulch, but sometimes it kills anyway.

Mr. J. S. Harris: I saw a little meat in that paper, and that was when he said he believed one reason why the Wilson had run out was on account of the carelessness in making plants. I believe the Wilson would be as good today as it was when it first came out if every man had grown a patch for plants only, and set plants from thoroughly set and matured runners, the first, second and perhaps the third setting of plants, the largest plants every year—from plants that had not produced, or at least not enough to exhaust them. We find that all those varieties that are great plant makers have run out unless that course has been pursued.

Mr. Hartwell: Can't you renew the vigor by selection?

Mr. Harris: Taking the most vigorous plants and keeping the vigor up, you can increase the productiveness. After the Wilson was supposedto have run out, I had one bed one end of which was loaded with berries, and I took a few of the best plants from that bed and raised one hundred plants and set them out, and I had as good Wilson berries as I ever saw; but in a year or two they went back to the common Wilson again.

Mr. O. C. Gregg: I would like to ask Prof. Hansen what he thinks about restoring or endeavoring to restore the vitality of a plant like the Wilson by this law of selection?

Prof. N. E. Hansen: I think in horticulture we have not given enough attention to the selection of plants and cuttings as well as cions. They are beginning now to select cuttings from currant bushes and cions from plum trees only from the most productive bushes and trees. There are no two buds of a tree exactly alike; there is a difierence in them, and this has been proven by experiment. So in all of our cuttings of cions and grafting we should be extremely careful to get them from

the most productive indivíduals; and so with strawberries, or any plants that are multiplied by division, this same careful individual selection should be followed which will renew the vitality of any plant. The Wilson berry has simply lost its vitality and productiveness by this lack of careful selection, and by planting on unfavorable soils, and plants have been taken from plants that have been weakened by overbearing and planting on unfavorable soils, so that the vitality has been lowered. It is the same with certain strains of tomatoes and plums. And so this careful selection should be carried out with all fruits, and even with our ornamental shrubs. We know there are certain ornamental bushes that if propagated from certain portions of the plant, that is, if cuttings are taken from certain parts of the plant, they will flower well. So in our horticulture this fact is being recognized more and more, and a study is made of individual buds as well as of the plant itself.

Mr. Wedge: It occurs to me that we have so many new and so many newer varieties than the Wilson, that are so much better in every way, that it is hardly worth our time to speak about the Wilson.

Mr. Gregg: Give us the names.

Mr. Wedge: The Lovett is better; the Bederwood is ten times as productive. The great value of the Wilson consisted originally in its good bearing qualities and good shipping qualities. We have many varieties that are fully equal in shipping qualities and far superior in productiveness.

Mr. Hartwell: This question of productiveness has been pushed to the limit, it seems to me, until now we have got to look at the question of quality and size as the most important factors in our berry production. I secured at least 8,000 quarts to the acre of the Warfield berry, and the quality was excellent. Had not that been the case there would have been no profit. The markets for small fruits all over the country have been profitless the past season on account of over production. I think we have got to select from our largest and best quality of berries if we consider the profit of growing for market.

Mr. S. D. Richardson: Mr. Mills, of Garden City, raises strawberries for the money there is in them. He has raised about all the different varieties. I got a letter from him a few days ago in which he said the Bederwood and Crescent had given him the best satisfaction.

THE VALUABLE NEWER VARIETIES OF STRAWBERRIES.

W. S. WIDMOYER, DRESBACH.

Since I do not pretend to try *all* the new varieties as they are put on the market, I shall have to confine myself in this report to those I have tried for one or more years.

Of the comparatively newer varities of strawberries, I have fruited the following the past season, some of them for the first time: Columbian, Marshall, Fountain, Annie Laurie, Bouncer, Dew, Splendid, Brandywine, Cyclone, Greenville, Dayton and Glen Mary. I had the first ripe fruit of the Dayton, June 4th; Columbian, June 5th; Cyclone, June 6th; Annie Laurie, June 7th; Marshall, Fountain and Cumberland, June 8th; Bouncer, June 9th; Greenville, June 10th; Dew, June 11th; Brandywine and Glen Mary, June 12th.

Referring to my notes taken during the fruiting season, I find the Columbian, Cumberland and Dew marked, quality *best*. The Dew is too shy a bearer to plant for market, but is a good one for amateurs who care more for size and quality than for quantity.

Fountain, Greenville and Glen Mary are of good quality. Marshall is a good yielder of fair sized berries, of only fair quality when grown in thick matted rows, but when grown in hills or narrow rows and properly thinned, they are one of the best for home and close-by markets.

Annie Laurie is a large berry, but has most too many rough, ill-shaped and green ends, and is very sour. I shall try it another year, however.

Bouncer, I think, is the same as the old Cumberland, or "Jumbo."

Dayton and Cyclone, are the two earliest of those named, both good yielders of fair sized, light colored berries, too soft for shipping, however. The fruiting season of the Cyclone is the longest of all the early varieties, which makes it a good berry to plant for home use.

The Columbian is also a very early berry, of best quality, berries averaging good size throughout the season; of a rich red color all the way through, making it a good one to can. It yields as heavily as any early berry I know of.

The Greenville is one of the best for market on account of its nice even size, which it holds to the last picking; no rough berries, good quality and yielder; only fault it has is being a little soft, which makes extra careful handling necessary.

The Brandywine is one of the best shippers we have, being of good size and color, but does not yield as much as some of the others though. I noticed our pickers nearly always asked for berries "from the six rows on north side of field," (Brandywine) when they wanted berries to can.

Glen Mary fruited first this season, and, while they were full of immense clusters of very large berries, there were a great many rough ones and some green ends. Perhaps it was because there were no other varieties growing near them. While they are a staminate variety, I found a few berries on spring set plants, in the field where there were other varieties on each side of them, which were

very fine in shape and color and about as large, if not the largest, I ever raised.

I consider Columbian, Brandywine, Greenville and Glen Mary the best of those named in this report, and if I was confined to these newer varieties for the next year's planting, would plant the four named, mostly Brandywine and Greenville, using Splendid as a fertilizer for the Greenville, but I doubt if they would be any improvement over the old Warfield for a market berry, especially when the Warfield is fertilized with Bederwood or Lovett.

I received a few plants of an unnamed variety last spring from the secretary of the Muscatine Fruit Growers' Association, which he claims is planted very largely there as a pollenizer. Will give his description of it: "It is a staminate, of no value for fruit, but of extreme vigor as a pollenizer, especially for the Crescent; it is so strong in pollen, it is set at varying distances, every fourth, fifth or sixth row, and each pistillate bloom appears to get its full share of pollen, as shown by the fruit."

As soil has as so much to do with the success or failure of some varieties, will say that my soil is a sandy clay loam which never bakes.

Mr. Harris: I would like to have the opinion of this audience as to the value of the Splendid. He does not tell us whether it is good for anything or not. Of all the varieties I had last year the Splendid stood at the head. It was a good yielder, it was the easiest picker, the berries were uniform in size and shape, and the quality very good.

Mr. Wm. Lyon: The Splendid has done nothing for me. I have had it three years, and it amounts to nothing; perhaps it is the soil. It is a shy bearer. The few berries I got were of a good quality. I shall plow it up in the spring.

Mr. Hartwell, (Ill.): You have struck a subject at the start that I am greatly interested in. In regard to this berry that has just been spoken of, perhaps I can bear testimony as to its value, because I live within ten miles of its babyhood. It originated at Sterling. I had it on my farm in large quantities for two years. Last year I was very much disappointed with it, not with its bearing qualities or size, but we had a winter in May in our country. Our berries were just getting ready for market, and we put them in cold storage in the field, and the outcome was that although our Splendid ripened, the fruit was barely colored. I had Splendid that was practically of an orange color when fully ripe. I never saw anything like it. This year I can reproduce the testimony just offered in favor of the Splendid. They bore with the Warfield. I think they are a little larger than the Warfield. I got $2.75 per case for them, shipping them 250 miles south, when some berries were

selling on the track at one dollar a case. It seemed to me that was a pretty good endorsement. While on my feet I wish to speak about another berry, the Clyde. It has not been spoken of yet. I have only fruited it for one year, but it is the most promising of forty or fifty varieties of strawberries. It is of good size and shows nice, but I am inclined to think it is not the best class of shipping berry. There is another new variety variety of Illinois origin we think very much of. I believe it originated with Mr. Reel, of Alton. I received a case from him that had been reshipped two or three times before they reached my place. I put them in the hands of one of our dealers who is an expert in fruit, and he said in quality and size he had seen nothing finer. They call it the "Ruby." It is so named on account of its peculiar redness all the way through. It is a solid red all the way through, and I think it is one of the most promising varieties we have. I would like to hear some testimony on the Clyde if it is grown here.

Mr. Lyon: I had a few plants of the Clyde a few years ago, but this last season I had a row of one hundred feet, and they out-yielded two to one of anything I had on the place, and I had a large amount of the older and new varieties. They are not going to be a first class shipping berry; that is the only trouble.

Mr. C. W. Simpson: I fruited the Clyde the past season, and I was very much pleased with it. They are a nice, even, smooth berry, a good yielder, but inclined to be a little soft for shipping.

Mr. Wedge: I think we have just now coming forward new varieties of strawberries and raspberries that are going to prove very valuable. We have improved more in the last eight to ten years than perhaps in all the previous time. I do not know whether I am right or not, but that is the way it seems to me.

Is a Hedge Fence Desirable?—At the recent Christian Co. (Ill.) Farmers' Institute, Mr. S. C. Wagner in a general way stated that hedge fences for Illinois farmers were undesirable. He stated that many of the best German farmers in this and adjoining counties were digging up their fine hedge fences and burning them. On being questioned as to the reason for this they state they cannot afford the loss of so much ground. The strength is taken from the ground for more than a rod each side, and besides the hedge is a harbor for rabbits and all kinds of insects. It takes a number of years for the hedge plant to get large enough for layering, and even then the fence is at best only suitable for keeping in horses and cattle. Very few hedge fences will turn hogs or sheep.

BLACKCAP RASPBERRIES.

O. M. LORD, MINNESOTA CITY.

Blackcap raspberries were mentioned in the U. S. Agricultural Department Report for 1853 as being grown only in the gardens of private gentlemen, and that being found wild so plentifully it would be a long time before they could be profitably cultivated. In 1858, the Doolittle, which originated near Buffalo, in New York, attracted particular attention from its unusual size and great productiveness. Though numerous chance seedlings and selections from wild ones were brought to notice about this time, the Doolittle took the lead as a commercial variety for several years. As late as 1866 it was considered the hardiest and best variety for general planting.

The character, habits of growth and appearance of the different varieties are so nearly alike that no particular description is necessary here. The type of fruit, however, is quite variable. The methods of cultivation were not materially changed till about 1882, when their cultivation received quite an impetus from the fact that that the dried fruit was in good demand, at good prices, in the general market. The old way of using stakes or trellis was abandoned, and the bushes were made self-supporting by pinching back the canes at an early stage of growth and also shortening the laterals before the fruiting.

Among the varieties that have attracted particuliar attention for distant marketing and for drying, the Gregg and Nemaha are probably the leading kinds at present, though many individuals and localities have their special favorities among other varieties. For early fruiting, the Souhegan, or Tyler, has long occupied a promi. nent place. The Palmer will eventually supersede all other early varieties in this vicinity. Some varieties appear to be better adapted to some localities than others. I do not know of any well attested experiments that would determine the particular varieties best adapted to particular soils. The Older, the Ohio, Davidson's Thornless, Johnson's Sweet, Progress, Kansas, Babbitt, Hannibal and others, are highly recommended in some places. Mr. Harris states that wild ones were common about LaCrescent when the country was first settled, but there were none growing wild in this vicinity till 1864 or about twelve years after the first settlement.

It is not found necessary here to protect the canes in winter. Mr. Underwood says they need winter protection about Lake City. J. M. Smith, of Green Bay, Wis., said it paid him to lay down and cover the canes in winter.

The markets in nearly all towns and villages are generally well supplied with the fruit in its season, but whether the practice of laying down is general I do not know.

From improved varieties and methods of cultivation, the fruit has become very popular, though a late Rural New Yorker says, in Michigan many are abandoning the cultivation from a glut in the markets, while others find it profitable and are increasing the average. The only problem seems to be, cheaper methods of production, picking and marketing, as no difficulties occur in growing on account of soil, climate or special adaptability.

SHADE TREES FOR ORNAMENT ABOUT THE HOME.

L. R. MOYER, MONTEVIDEO.

About the time I bought my first village lot, I came across a copy of the Forest Tree Planter's Manual, by the late Leonard B. Hodges, in which he advocated planting the cottonwood as a useful pioneer tree. I was a pioneer, so I proceeded to surround my lot with a row of cottonwood trees. The ground was virgin prairie, just broken, and the young trees flourished. It was not many years before I purchased another lot and when I had brought that within my enclosure I found that I had a thrifty row of cottonwoods running through the middle of my premises. I dug a well in the middle of the property near the row of cottonwood trees. It was not long before the roots of the cottonwoods had taken possession of every part of the garden, exhausting the soil moisture, so that all the young apple trees that I had planted died. And then one summer the well became dry. On investigation I found that the roots of the cottonwood trees had gone down into the well behind the brick curbing, and had filled the well full of roots and exhausted the water supply. After that the cottonwoods began to die, and I began to expedite the process. The mistake had been a costly one, and a few sickly cottonwoods along the street front still bear testimony to my unwisdom in planting them where they do not belong. The Cottonwood is a grand tree on a river bank or in moist soil, but in such a place one would scarcely care to build his house.

You will naturally want a row of street trees in the vacant space between the sidewalk and the curbstone line. In most of the prairie towns of western Minnesota the Box Elder has been quite generally planted for this purpose. But it, too, is very unsatisfactory. It grows rapidly when young and promises well; but it soon gets its full growth and ages rapidly while yet a small tree. The leaves are covered every summer with innumerable aphides, and it becomes a lousy, loathsome thing. The operations of the aphides cause the leaves to exude a sort of honey dew, and this attracts myriads of flies of all classes and descriptions—many of them of very plebeian tastes. The Box Elder is attacked, too, by the Leptocoris trivittatus, a gray bug with red markings, and towards autumn great streaks and patches of these bugs may be seen congregating on the south side of the Box Elder as well as on verandas and the fronts of houses. Rumor has it that these bugs occasionally bite people; that they injure fruit and other trees is well settled. These insect enemies cause the Box Elder to drop its leaves very early in the season, almost before the summer is over. This disfigures the lawn and impairs the value of the Box Elder for shade. I would not plant the Box Elder for street trees nor for ornamental trees about the home.

The best street tree, so far as I am able to judge, for the prairie towns of western Minnesota is the White Elm (Ulmus americana). This tree is native to all parts of the state, but prefers a somewhat moist location. Where the soil is quite dry it might be better to substitute the Cork Elm (Ulmus racemosa). This elm is native to a

large part of southern Minnesota and appears to be better adapted to dry locations, preferring such in its native habitat.

In planting a row of street trees, it is well to avoid placing them too close together. The tendency to over-plant in a prairie village is well nigh irresistible. The prairies look so large and the trees so small. It is well, I think, to set each alternate tree along the street with some quick growing species. I know of nothing better for this purpose than the Silver Maple (Acer sacharinum, or, as it is called in the old botanical manuals, Acer dasycarpum.) On the prairie lands of western Minnesota this tree is rarely broken by the wind and must be voted a success. When the elms begin.to attain size, the maples should be removed.

Another very successful street tree is the Green Ash. This tree is known to the younger generation of botanists as Fraxinus lanceolata, but is perhaps more commonly called Fraxinus viridis. It is the common native ash tree throughout the prairie portion of the state. The Green Ash does extremely well as a roadside tree wherever planted.

Another very valuable street tree for the prairie portion of the state is the Hackberry (Celtis occidentalis). This very excellent tree is at home on the prairies. The Hackberry is rather slow in coming into leaf in the spring, but makes up for this by the umbrageous luxuriance of its summer foliage. Should you fail to get a Hackberry as a street tree, you can hardly afford to miss having a tree or two in the timber plantations of your home grounds.

The subject of ornamental tree planting about the house is a very broad and a very difficult one. No two locations present the same problem. To secure the best results each locality must be studied by itself—and it is here that the services of a professional landscape engineer ought to be secured. If your home is on the prairies, your home ought to front to the south or to the east. You will then want shelter on the north and west. Here you should plant an irregular border of such trees as Scotch Pine (Pinus sylvestris), White Spruce (Picea canadensis), Red Juniper (Juniperus virginiana), Bull Pine (Pinus ponderosa), Blue Spruce (Picea pungens) and Mountain Pine (Pinus mughus, or Pinus montana). Here, too, should be located that grandest of all deciduous trees for prairie planting, the Bur Oak (Quercus macrocarpa).

If from your house you have a view over a river valley or across a lake, or if in any direction there is an interesting sky line, you must study to preserve it, or even to accentuate or improve it, by leaving an irregular vista through your plantations in that direction. If on the other hand there are some disagreeable features in your landscape, such as a neighbor's untidy barn or pig pen, then you should plant it out by so disposing your groups of trees and shrubs that the objectionable features of the landscape will be eliminated by being hidden behind an attractive border.

It is well to so dispose your tree planting as to leave a lawn of some considerable extent uninterrupted by trees, from which irregular vistas shall lead off through the trees toward the more distant and secluded parts of the grounds.

If there is a dusty street along the south side of your premises, or if the country in that direction is open, you will need some protection from the dust and from the hot south winds. For this purpose I think there is nothing better than an irregular shrub border. Here I would plant Lilacs in a dozen different varieties, Bush Honeysuckles, Caraganas, Russian Olives, Philadelphuses, Prunus Maackii, Pyrus Tortingo, Prunus Tomentosa, Manchurian Maples and other hardy shrubs.

Few foreign trees have so far proved to be of much value in Minnesota; but we have a rich sylva of native trees. The Bur Oak has already been referred to as one of the grandest of the oaks. It grows throughout the state, but the Bur Oak of the rich prairie lands of the west is a far different tree from the Bur Oak of the sand barrens of Minneapolis.

The Scarlet Oak (Quercus coccinea) is a native tree in eastern Minnesota, and will probably grow with a little encouragement throughout the state. It is of this tree that Thoreau has written so beautifully in his wonderful essay on Autumnal Tints. A few Scarlet Oaks might well find a place on your home grounds.

The Basswood (Tilia americana) is entitled to a place on your home grounds if your soil is rich enough. It is not adapted to sandy ground nor to a dry location. It is subject to sun scald and needs some shelter. It may be grown on the prairie by allowing it to sprout freely from the ground, as it is naturally inclined to do.

The Sugar Maple (Acer saccharum) is so grand a tree that one can scarcely resist the temptation to plant it. If your home ground is very rich and moist, and there are cottonwoods near by, the chances of success with it are quite good.

The Coffee-tree (Gymnocladus dioicus) is a small sized picturesque native tree, and may be introduced into your home ground with advantage.

The Hop Hornbeam (Ostyra virginiana) is a small sized native tree, very attractive in foliage and fruit, and may well find a place on the home grounds.

If the home grounds are of considerable extent, and especially if part of it runs off into a ravine or some rather low ground, or toward a lake, you should not fail to plant the Russian Golden Willow and the Salmon Barked Willow. These two willows are regarded by botanists as varieties of Salix alba, but they are very distinct in cultivation. The bright golden and red twigs of these willows give a touch of brightness and color to the winter landscape that is very desirable.

If your home grounds are small you will not have room for many trees; and in any event do not overcrowd them. It is better on your home grounds to depend mostly on hardy shrubs for decoration. Use the list printed in the last volume of the report of our society, and you will have something that has been tested and sure to succeed with a little good cultivation. An irregularly planted shrub border surrounding your lawn and defining the boundaries of your home acre will give you more satisfaction than a crowded collection of dwarfed and starved forest trees.

WHAT FLOWERS SHALL WE PLANT ABOUT THE HOME?

MRS. L. A. DANFORTH, RED WING.

There are few, if any, who would say that flowers for the home were not necessary, and that there was no profit in them. They bring cheer and gladness to the heart as well as being pleasing to the eye. The time and labor given in growing them brings its reward in many ways. The home is made more attractive, while the exercise in the outdoor air gives health and strength.

There are many we would like but cannot have; therefore, we think first of those which are indispensible. First of all, then, we must have sweet peas; so we do not wait for warm weather, but as soon as the frost is out of the ground, in some suitable place we plant them. I once planted them in the fall and was rewarded by having them in bloom a few days earlier than usual, but the next year, putting them where the soil was not sufficiently drained, they were a failure.

The pansy will come next as a general favorite. These, and the nasturtiums are useful for bouquets. The petunia, too, is not to be despised as a flower for the vase, especially the white petunia.

For fragrance we sow mignonette and sweet alyssum. The latter makes a nice border for a flower bed. Lavatera is pretty in bouquets as well as in the garden. Phlox Drummondii, verbenas and dianthus Chinensis make showy beds all summer if started early. The hotbed is very useful for starting these and some of the other annuals. The asters are among the most beautiful flowers for late blooming.

We want poppies, for there are many beautiful varieties, but their period of bloom is not long, and they have unsightly stalks to be pulled up. Ten weeks stock is very satisfactory. Its spikes of double, sweet-scented flowers are very enduring. The snapdragon, too, is a pretty flower which lasts a long time.

For an annual climber nothing that I know of is so beautiful as the morning glory.

I would plant many bulbs of the gladioli, because of their magnificent spikes for cutting.

Of perennials we will have hollyhocks, Canterbury bells, delphinium formosum, perennial poppies, aquilegia and perennial phlox of different colors.

The aquilegia, or columbine, scatters its seeds, which germinate more readily than those you buy. The Rocky mountain columbines, with large flowers and long spurs, are interesting, but none are more graceful than the wild columbine of Minnesota, (Aquilegia canadensis), which we may transplant from the woods.

We must have peonies of different colors. Iris is desirable if there is plenty of moisture.

Tulips, jonquils and narcissus make a fine display in the early spring.

Some of the best of the flowering shrubs are the lilac, snowball, spirea Van Houtii, flowering almond and weigela.

The flowers named are but a few of the many which are desirable to plant about the home. We may choose those we like best.

Whether we cultivate few or many flowers, however, we must not neglect to plant roses. No garden is complete without them. The rose is truly called the queen of flowers, for it is unsurpassed in beauty by any other. A rose garden well repays one for all the care and expense it requires. It is a delight to go out in the morning, while the buds are partly opened and gather them to adorn our rooms. We may cut them freely, and not only enjoy them ourselves, but send them to those who are so unfortunate as not to have them, and we may be sure they will be appreciated.

THE SHELTER BELT IN MANITOBA.

H. L. PATMORE, BRANDON, MANITOBA.

Although in Manitoba, especially in the northern part of the province, may be found a considerable area of scrub and bush land, the need of shelter belts and windbreaks is felt by the farmers and others in all parts of the province; and a considerable amount of discussion amongst the farmers themselves, and in their institutes and farming papers, as to the best means of providing suitable windbreaks, has been carried on for several years past. *Still*, progress in the way of planting and successfully growing suitable shelters is as yet very slow.

The principal reasons why this is so are that the spring season being usually such a busy period the farmers are not able to give their attention to the work at the most suitable time, and also because, being in a new country, it is not generally known which are the best methods of providing shelter, and which are the best trees to be used for the purpose.

I am, therefore, glad of the opportunity to send this paper to your convention, because with your longer range of experience, you will probably be able to give us some suggestions, which will be profitable to us in the future.

During the past summer, I met with a party of Nebraska farmers who were traveling in this province. Hoping to learn something from them, I asked many questions as to the general experience with tree planting in Nebraska, and I was rather surprised to be told that after many years of experience the farmers found that the box elder was one of if not the best and most profitable tree they could plant for either shelter or wood.

In this province we have various authorities, each with a slight difference of opinion on the subject. The box elder has few friends among them, for one will claim favor for the elm, another for the cottonwood, another for the Russian poplar, and so on; and as to the method of planting, one will claim that it is necessary to plant a wide belt of rows of assorted tree, while others will advocate simply hedges in single or double rows.

I do not expect that you will be able to tell us just what opinion is right or wrong on the subject, but I do hope to learn from you something of the experience you have had in providing the beautiful shelters and groves of trees to be seen in traveling through the state of Minnesota.

Now for a little of my own experience as to what can be done here in this province. In 1889 I helped to plant a shelter belt on the

experiment farm near here. A strip of land on the west side of the farm was ploughed and planted with eastern grown seedling trees of about forty varieties, composed of maple, ash, elm, birch, ever. greens and several of the largest class of shrubs, planted in eleven rows, each row nine feet apart, and each seedling nine feet apart in the row. The next spring a very large percentage of these were dead, and it was found advisable to fill up the vacant spaces with northern grown seedlings and to plant four and one-half feet each way instead of nine feet, as tried the year before. After nine years that belt of trees is now fifteen to twenty feet in height and very thick, and it makes a splendid shelter belt, but I think now it would have been better if only trees of one class had been used, such as maple, ash, elm and poplars or all evergreens, for it appears to be useless to plant evergreens or the slower growing of deciduous trees amongst the faster growing varieties, unless a great deal of space is left between them.

Where I am now living I have a belt of box elder trees grown from seed sown in 1884. This belt is 100 feet wide and a quarter of a mile long. These trees are now about thirty feet high, with stems six to eight inches through. This belt in the winter season fills up with snow and effectually shelters my neighbor on the east side of me, as I have my buildings amongst the trees, where the snow drifts very high in winter.

I also have a block of about six acres of land, on which in 1891 were planted three hedges of maple seedlings, the hedges forty feet apart, and the seedlings two feet apart in the row. These all grew and are now about twenty feet high, and are growing much faster than the trees in the belt raised from seed. The two outer spaces fill with snow five to six feet deep each winter and afford the best of winter protection to strawberry plants and other fruits, but the middle space of three acres is always clear of drifts in winter and well sheltered at all seasons.

After noting the effects of these two systems of shelter, I am now inclined to the opinion that while the wide grove of trees is very desirable, a cheap and very effective shelter can be provided by planting two or three single rows of trees on the most exposed sides of the buildings, especially if sufficient space is left between the rows to allow for the accumulation of the snow.

Although we have spruce and pine growing in the various bush districts of the province, I have not as yet heard of any shelter belts which have been successfully grown with evergreen trees. Many thousands of spruce trees are transplanted from the bush each year generally in the month of June, but the transplanting nearly always appears to be a total failure. I think myself that earlier planting on well prepared lands would probably be attended with better success.

In conclusion I would ask your convention a few questions.

How can the average prairie farmer, who has a busy time seeding in spring, best arrange to plant a shelter belt?

Which have you found to be the best method of planting, and the most suitable trees to be used for the purpose?

How do you advise treating evergreens for transplanting onto the open prairie?

MINNESOTA FOREST RESERVE LAW.

(ENACTED 1899.)

AN ACT

TO ENCOURAGE THE GROWING AND PRESERVATION OF FORESTS, AND TO CREATE FOREST BOARDS AND FOREST RESERVES, AND TO APPROPRIATE MONEY THEREFOR.

Be it Enacted by the Legislature of the State of Minnesota:

SECTION 1. There is hereby designated forest reserves for the state, to be known and designated in all public documents as the "Forest Reserves," to be managed and controlled as herein provided, which shall consist of all such tracts and parcels of land as shall be set apart from any state lands, by the legislature, for forestry purposes; or which shall be deeded, devised, or granted to the state for forestry purposes, under the terms of this or any subsequent act, by any person or persons; or granted to this state by the United States government for forestry purposes, where such grants from the United States government have been accepted by the legislature of this state; or given or devised outright, for forestry purposes, to the state, by any person or persons.

SEC. 2. There is hereby created a forestry board for the state, to be known and designated in all public documents as the "Minnesota State Forestry Board," which shall consist of nine (9) members, to be designated or chosen as follows, to-wit:

1st. The person who by law is for the time the chief fire warden of the state shall be ex-officio a member thereof.

2d. The person for the time occupying the chair of horticulture in the agricultural department of the University of Minnesota shall be ex-officio a member thereof.

3d. Three (3) persons, citizens of the state, shall be recommended for appointment by the regents of the university in January, or as soon thereafter as possible, of every other odd-numbered year, commencing in eighteen hundred and ninety-nine (1899), for a term of four (4) years each, one of whom shall be selected on account of his interest in and knowledge of the planting, cultivation and preserva tion of forest trees and groves, in the prairie regions of the state one of whom shall be selected on account of his interest in and knowledge of the best methods for the preservation of the natural forests of the state, and of reforesting denuded lands; and one of whom shall be selected on account of his interest in and knowledge of the best methods of protecting the sources of supply of the several river systems of the state.

4th. Four (4) citizens of the state shall be recommended for appointment as members of said board as follows, viz.: One by each of the following named associations or bodies, for a term of two (2) years each, in January, or as soon thereafter as possible, of each odd-numbered year, as follows, to-wit: The Minnesota State Forestry Association, the Board of Managers of the Minnesota State Agricultural Society, the Minnesota Horticultural Society and the State Fish and Game Commission.

5th. The recommendation for the appointment of such members shall be properly certified by the proper respective officers of such association, or bodies to the governor of the state, who, if he shall deem the persons so recommended suitable and proper persons therefor, may appoint and issue a commission to each of them; vacancies in membership shall be filled in the same manner.

SEC. 3. The board shall appoint a secretary of the board, who shall have charge of all books, maps, records, title deeds and papers, and documents of the board, and shall keep the minutes of all meetings of the board and executive committee, and shall prepare for printing and publication all bulletins, reports, circulars, rules, regulations, by-laws and other documents, ordered printed or published by the board. He shall cause to be made accurate maps of all tracts and parcels of forest reserves, which maps shall be open to the inspection of any person desiring to inspect the same, but under such rules as the board may prescribe.

All such books, maps, records, title deeds and papers and documents shall be kept in the office of the secretary, who shall also keep a record of the names and addresses of all beneficiaries under this act. The secretary shall keep a record of all warrants for the payment of money issued, and shall countersign each warrant which shall be signed by the president.

SEC. 4. No member of such board shall receive any pay for his services but shall be repaid actual reasonable expenses incurred in attending meetings of the board and executive committee, or in performing services at the request of the board or executive committee.

SEC. 5. The state treasurer is hereby required to act as the treasurer of said board, and to keep accurate books of account of all money received and paid out for or on account of the said board or said "Forest Reserves," according to law and the by-laws of said board, and all funds appropriated for the use of the board, or which may in any way come to its use, disposal or control from the sale of timber or otherwise, shall be deposited with the state treasurer, and kept, and books and accounts of the same kept under the designated name of "Forest Reserve Fund," and there is hereby appropriated from any moneys in the state treasury not otherwise appropriated the sum of one thousand ($1,000) dollars, annually, to defray the reasonable, necessary expense of said "Forestry Board" in carrying out the provisions of this act, which sum shall be credited to and be a part of said "Forest Reserve Fund." Said Forestry Board shall not be authorized to expend in any one (1) year any greater amount than the one thousand ($1,000) dollars herein provided.

SEC. 6. The care, management and preservation of the Forest Reserves, and the forests thereon, as well as future growths thereon, and all moneys appropriated in that behalf or collected therefrom in any way, and all personal property acquired to carry out the object of this act, are hereby confided to and invested in said Minnesota State Forestry Board, as the same may be herein, or in subsequent acts, defined and required.

The board shall observe, keep in view and so far as it can, ascertain the best methods of reforesting cut-over and denuded lands

foresting waste and other prairie lands, preventing destruction of forests by fire, the administering of forests on forestry principles, the encouragement of private owners in preserving and growing timber for commercial and manufacturing purposes, and the general conservation of the forest tracts around the head waters and on the water sheds of all the water courses of the state, and for these purposes to make reports of its doings, conclusions and recommendations to each session of the legislature, and from time to time publish, in a popular manner, and print for popular distribution, in bulletin or other form, such of its conclusions and recommendations as may be of immediate public interest.

SEC. 7. The members of said board may choose a president and vice-president annually, in January, or as soon thereafter as possible; may contract and be contracted with, in the name of the State of Minnesota, or in its behalf; adopt and use a seal, and alter the same at pleasure, and cause actions to be brought in the courts in the name of or in behalf of the state, to protect the state's interest in all matters confided to the board's care; a majority of the members shall constitute a quorum for the transaction of business, and a less number may adjourn from time to time. The board may make all reasonable rules, regulations and by-laws for the government of its own meetings and actions, and for the conduct of its officers, agents and employes, and for the care, management, protection, and preservation of the Forest Reserves and the forests thereon, and may appoint such needed agents, officers, attorneys and employes as it deems best.

The board may appoint an executive committee annually, on which it may confer authority to perform any executive act, and to exercise its judgment in minor details which cannot be conveniently acted upon by the board.

SEC. 8. The respective town boards of supervisors and county commissioners are hereby constituted, respectively, town and county forest boards, which shall only have such pay for services as shall be expressly authorized by the legislature, and which shall only perform such duties, have such authority and exercise such powers, as may hereafter, herein or in subsequent acts, amendatory or otherwise, be expressly conferred by the legislature.

SEC. 9. Any person or corporation being the owner in fee simple of any cut-over or denuded, or partially cut-over or partially denuded, natural forest lands, which will not probably be utilized for many years for agricultural purposes, or any bare or waste, or partially bare or waste, rough prairie land, or very sandy, very rough or very rocky lands, in this state, or any lands deemed absolutely necessary for the preservation of water courses (all to be determined by said state forestry board), may deed the same to the State of Minnesota for forestry purposes; all lands so deeded to the state for forestry purposes by any person or corporation are hereby forever dedicated for forestry purposes.

Before such deed shall be made and delivered, a proposition in writing shall be made by such owner or owners to said state forestry board to so deed the same for forestry purposes, under the terms of

this act, and amendments thereof, made prior to such offer, and the question of the acceptance thereof shall be referred to the town or county forestry board where the land is situated (or both such town and county forestry boards) for its advice on the question of accepting the same; and said state forestry board or its executive committee, may hear the person offering so to deed, or his or her representative, and also may hear such town or county forestry board or its representative, both sides in person or by written reasons submitted why such deed should or should not be received, and the decision of the state forestry board to receive or reject such offer and deed shall be final. Such deed may be made by quit claim, when by the advice of the attorney general, or by the advice of its attorney, if said board have one, said lands are clear of liens except for taxes and tax sales still owned by the state.

When such deed shall be so accepted by the board the lands thereby conveyed shall become a part of the Forest Reserves of the state.

SEC. 10. At least once in every five (5) years, and as much oftener as the state forestry board may decide, the accumulated income from each tract of land so deeded by the persons or corporations for state forestry purposes, shall be divided by the state forestry board and disposed of as follows, to-wit:

FIRST. One-third (⅓) shall belong to the state, to reimburse the state for the care and protection of the forests thereon, and for the non-payment of taxes thereon to the state, county and town, which one-third (⅓) shall be divided between the state, county and town where the land is situated, as follows, to-wit:

One-half (½) to the state, one-fourth (¼) to the county, and one-fourth (¼) to the town.

SECOND. Two-thirds (⅔) shall be paid to such public educational institution or system in the state as the grantor may designate in the deed of conveyance, or in a separate instrument executed as deeds of land are required to be executed and recorded in the office of the register of deeds of the county where the land is situated, or by will. But in case the grantor fails to so designate such institution or system, or if for any reason such institution or system fails to exist, then the same to be paid to the proper officer or officers, or boards for the benefit of the public school system of the state and the University of Minnesota, the public school system to have three-fourths (¾) thereof, and the said university to have one-fourth (¼) thereof.

SEC. 11. The state, by and through said state forestry board, shall have full power and authority to lease for revenue, or for protection from fire, trespassers, or otherwise, low meadow tracts, or other tracts for pasture, when the same will not interfere with the growth of forest trees, and to sell dead and down timber and mature timber, and to deed said tracts or parcels or parts of the same, where the growth of towns, the building of railroads, water power or other public improvements may demand alienation by the state; and said state forestry board may cause to be cut and sold, or sold with the right to cut and haul away forests or trees, when said board

may determine that the state's and the beneficiaries' interests will be subserved by so doing, but all proceeds of such sales or leases shall be divided as is the income therefrom as above provided.

SEC. 12. This act shall take effect and be in force from and after its passage.

Approved April 13, 1899.

HORTICULTURAL SOCIETY PRINTING LAW.

(ENACTED 1899.)

A bill for an act pertaining to the reports of the Minnesota State Horticultural Society, and appropriating money for printing the same.

Be it Enacted by the Legislature of the State of Minnesota.

SECTION 1. There shall be annually printed and bound three thousand (3,000) copies of the report of the Minnesota State Horticultural Society, provided, the number of printed pages of the same shall not exceed six hundred (600).

One thousand copies of the same, more or less, as requested by the executive board of said society, shall be printed in monthly installments, and bound in paper, as a monthly report, to be distributed among the members of said society.

The remainder shall be bound at the close of the year in paper and cloth, as determined by the printing commission and president of said society, and shall be distributed by the society as follows: One copy to each of the state officers, members of the legislature, clerks and judges of the supreme court and members of the board of regents and faculty of the State University; ten copies to the State Historical Society, fifty copies to the State Agricultural Society, one to each public library in the state when application is made therefor, and the remaining copies as the Minnesota State Horticultural Society shall deem best.

SEC. 2. The sum of five thousand ($5,000) dollars is hereby appropriated to pay for the printing and binding of the monthly and annual reports of the Minnesota State Horticultural Society from August, eighteen hundred and ninety-seven (1897) to August, eighteen hundred and ninety-nine (1899), and the sum of two thousand ($2,000) dollars, annually, thereafter, to pay for the printing and binding of the monthly and annual reports of said society; said work to be performed and said sums paid under the direction of state printing commission with the approval of the president of said Minnesota State Horticultural Society.

SEC. 3. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 4. This act shall take effect and be in force from and after its passage.

FORESTRY.

ELMER REEVES, WAVERLY, IOWA.

It has been the fashion of certain writers to bewail the destruction of forests and lay all manner of evils, past and present and prospective, at the door of those who cut or permit the cutting of trees from any considerable tract of forest land. Thirty years ago there was quite an outbreak of this sentiment. It resulted in the planting of many groves all over this northwestern country, not alone for the protection of buildings, but in many cases with a view to the protection of growing crops, and a supply of fuel and wood for various uses.

It was predicted that the next fifteen years would witness the destruction of all our available supply of timber fit for building. Thirty years have passed, and lumber is sold at about the same prices, and the then visible supply is still drawn upon, and we have immense tracts of the best of timber added to the world's visible supply. It is also claimed on good authority, that in the prairie state of Iowa there is more timber now growing than there was thirty years ago. Considering these facts, it appears useless to attempt to scare people into planting forest trees. None of us are likely to live to witness much of a change in the price of lumber or wood for fuel or other purposes. If these thoughts have any weight, they may seem to cause a severe shaking up of the old sentiment regarding the destruction of forests, but facts as shown by experience are worth more than theories, and it is useless to urge false theories to induce the planting of trees in our prairie states. There are sufficient good reasons for planting. Not only may the planter reckon the money or practical value of the trees when grown to useful size, but the sentimental side of the question should be considered as well. Tree planting has a large share in home-making on our broad, wind-swept prairies. A house standing alone upon a treeless farm may be a place to live, but it is not a home. Plenty of trees and shrubs surrounding it, forming shaded nooks and corners, with stately specimens here and groups there, arranged either after the approved plan of the up-to-date landscape gardener or according to the owner's own sweet will, help to form a home. Each tree has its history. You remember where it came from. But whether pulled up in the forest, carefully grown from seed or bought from that rascally peddlar at four prices, it still has its pleasant associations. You remember when it came upon the place, its planting and where it now stands, the more or less anxious thought as to whether it would grow. You have watched with pleasure its slowly extending branches and steady growth and have shielded it from danger and perhaps nursed its wounds and shaped its top into its present comely proportions. You know its whole history. It is a child of your care and a part of your home. You may buy a farm with trees upon it and call it home, but it is an adopted home and not your home in reality until you have made it take on your personality by your care and plans.

Tree planting to make the home surroundings what they should

be must extend further than the ornamenting of the yard. A generous windbreak should be planted to protect all the buildings and yards and enough ground covered by a timber plantation to supply the home needs in the way of fuel, posts, poles, etc., that are so handy on any farm. Plant the native sorts mostly and on good ground, giving them as good or better care than you would a field of corn. It is surprising how soon the trees will attain a size fit for use.

The man who plants a large area of forest trees must do the work either for the benefit of his sons or for the general public good. He cannot expect to reap the benefit from his investment that he would from ordinary farm crops on the same ground and with the same outlay. The sentimental has much to do in all tree planting, and to the individual who plants a large area of forest trees this must be the incentive. The practical must be largely lost sight of. Experience shows that while our northwest prairies need large areas of forest for future use, the individual cannot afford to plant. The work must be done at public expense. However, let every land owner plant trees and that generously, not only for the benefit he may receive, but to beautify his surroundings and leave something to show the next generation that his life was not entirely selfish and in vain.

ANOTHER METHOD OF TREE BRIDGING.—If the tree splits apart I put two bolts through. One of these is placed three or four inches above the juncture of the limbs and another several inches below. I use a small washer. The new growth soon covers the ends of the bolts completely. The tree is securely held together, and there is no danger of its breaking off again. In one instance I had a large shade tree split down so that one-half was on the ground. I drew the broken portion up in place, then used a large auger for boring the holes. The work was a perfect success, as the bolts were soon covered with new wood, and the branch is still in perfect condition Last winter I had a beautiful specimen of arbor vitae which was split down during a heavy snow storm. One-half remained on the ground until spring, when I raised it into place and bolted it securely with two quarter-inch bolts. I hardly expected success, as the split surface had become seasoned and the fragments which held the main branch to the trunk was so thin that it was difficult to keep it from breaking off when working with it. This side of the tree kept its color all last summer and made a good growth. I have treated many trees in this way, and they always do well.—Ex.

APPLE BARREL LEGISLATION.—The state vice-presidents of the National Apple Shippers' Association are directed by the society to prepare proper resolutions urging the enactment by their respective state legislatures of laws making the legal barrel for apples conform to the packages adopted by the association. This is 17⅛ in. head and 28½ in. stave, with bulge not less than 64 in. outside measurement. The association also urges the necessity and fairness of the adoption by the transportation lines of a uniform weight of 150 pounds for a barrel of apples.

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NUTS FOR PLANTING.—Gather the nuts (walnuts, hickory nuts, pits of peaches, etc.), place in a rough bag and bury in the garden about a foot deep. By the time the frost is well out of the ground in spring, the shells will have burst, and the nuts can be placed in a bed specially prepared for them or put where the trees are to stand.

TREATMENT OF FROZEN FRUIT TREES.—The recent cold weather killed some fruit trees completely and injured many others. Some of the tender varieties were killed back to the main trunk, while with varieties a little more hardy only the tips of the branches were destroyed. In calling attention to this, the Ohio experiment station states that the best thing that can be done is to remove all parts that are seriously affected. It is well to wait until it is possible to determine about how much injury has been done, as shown by the discolored wood and shriveled bark; usually one warm spell is sufficient. It is possible to defer the work too long, as the frozen wood seems to have a deleterious effect upon the sound parts if not removed before growth commences. During March and April the pruning should be done.

Calendar for May.

O. M. LORD, MINNESOTA CITY.

Winter has lingered so long that the fore part of May is not too late for planting seeds, trees and shrubbery that we usually plant in April. It is safer to plant tender varieties after all danger of frosts is over, and when the ground is well warmed. Frost was still under the mulching of strawberries last week, and fence posts could not be set in some places, indicating that the season is more backward than usual. Strawberries where properly covered are in fine condition, and no mistake will be made in increasing the area this spring, as so many other fruits have been winter-killed. No one can say positively what variety will succeed best with you. A dozen each of a dozen or more varieties will well repay one for trial to find out which is most suitable to your soil, and each variety should produce plants enough for future use for one family.

Fruit plants in this vicinity went into the winter in good condition, but unprotected. Shaffer and Cuthbert raspberries are killed to the snow line; the Turner and Loudon have come through very well. The small planter for family use will do well to remember this, as they are both standard fruits and excellent of their kind. The others can be successfully grown but will cost more labor. The same advice can be given in regard to plum trees. Nearly all kinds except our natives are killed or injured so as to produce no fruit this year, while all the natives are unhurt. The Wragg and Russian cherry trees appear all right, also the old standard apple trees. The last winter will probably be recorded as one of our *test winters*, and it may be considered safe to plant any fruits that have lived through it.

Unprotected blackberries are killed. Blackcap raspberries of nearly all kinds are hurt in the bud, except the Palmer.

The seed and plant catalogues are so filled with names that the person without experience is puzzled to know what to plant, hence these notes if heeded may be of some use to the novice. Every farmer, gardener and fruit grower should grow his own seed as far as he can. Too much stress cannot be laid on the varieties adapted to the different soils, and the quality of the seed. The writer lost one year twenty-five bushels of corn to the acre, by planting the wrong variety. Two kinds were treated precisely alike, and one yielded fifty bushels and the other only twenty-five. A half crop of potatoes was lost by the same process, and this difference holds good in many of our garden vegetables. The educational advantages of our county and state fairs in regard to improved varieties, afford a fine opportunity for comparison and selection. A close in-

spection of our village markets will often show garden products of superior values.

It is rare that replanting gives good results, and, therefore, great care should be exercised in our first garden work. Where seeds germinate quickly, and all the conditions are favorable, replanting will sometimes do very well, but, as a rule, where a complete failure is made it is profitable to follow with some other crop that does not require so early planting. A fair crop of sweet corn, potatoes, squashes, etc., may be grown where other seeds have failed. A replowing is not necessary unless the soil has been impacted by heavy rains, but a good seed bed should be made with the cultivator or harrow; this will also destroy the weeds that would otherwise infect the early planted ground.

We hope that noxious insects and fungous diseases have been given a set back as well as some of our shrubbery. The intense cold has no doubt destroyed many of the insects, but where they go into the ground in the fall to change their form they are probably alive and will appear again in their season. The curculio and the currant worm may be seen and destroyed about the last of this month. The most effectual remedy for curculio is jarring the trees over a sheet and crushing the insects. For currant worms, a tablespoonful of Paris green to four or six gallons of water is the best application if given when they first appear. Melon, squash and cucumber vines must also be carefully guarded from the striped bug. Air slaked lime used every day has proved very satisfactory. The bugs are not troublesome after the plants are a week or ten days old.

We have always been advised to "take time by the forelock" in gardening, but the first of May this year finds our forelock in his hands, and we hardly know which way to pull first.

A HISTORY OF FOREST FIRES.—Among other evidence of the growing interest the general government is taking in the forests of the country, is the work now being prosecuted of writing up a history of the forest fires, to be not only descriptive but statistical. Mr. Otto Luebkert is now canvassing the subject in this state and will push his researches as far back as reliable facts can be secured. The result of this investigation will be interesting and a valuable stimulant toward forest preservation.—Secy.

QUALITY TEST FOR POTATOES.—We must learn to grade potatoes according to quality. There is just as much difference between a mealy and a soggy potato as there is between tenderloin and rump steak. The difficulty is to sort out the good ones. Here is the potato test: Wash them and then put them in a tub of water. They will all sink. Add salt and the poorer, lighter ones will rise. Add more salt and others will rise. Those which finally remain at the bottom you can warrant every time to be prime bakers. Not over 10 to 20 per cent of potatoes will stand the test. For these, your customers will gladly pay extra prices. H. B. C.

Secretary's Corner.

THE ORIGINATOR OF THE ROGER'S GRAPES DEAD.—Edward S. Rogers died at his home in Peabody, Mass., March 30th. He originated the many varieties of grapes known as Roger's Hybrids, many of them of great excellence. The Agawam, Massasoit, Lindley and some others are well known and very popular in our state. He is said to have been the second man to artificially hybridize the grape.

THE FOREST RESERVE LAW.—Several pages are occupied in this number with the law just enacted by our legislature creating a forestry board in this state. This law was the conception, as we are informed, of Capt. J. N. Cross, of Minneapolis, and while others assisted in framing it and worked earnestly in its interest, the credit of its final enactment largely belongs to him. The board provided for in this law will doubtless be organized at once. Our society will have one representative thereon.

MONTANA HAS A NEW SCALE LAW.—Montana has just created a State Board of Horticulture, whose sole duty seems to be to keep insects injurious to plants out of the state. The law is a regular ironclad and if executed efficiently should keep the orchards and nurseries of the state clean. It should be operative, too, as it gives its secretary $1,000 per year, and $5.00 per day to inspectors, with a necessary appropriation to foot the bills. The fruit industry in Montana must be thriving. We note the familiar name of S. M. Emery as a member of the board.

LIFE CERTIFICATES READY FOR DISTRIBUTION.—Certificates for the life members of this society are now ready for distribution. They are printed on light cardboard and can be sent safely by mail enclosed in a stiff pasteboard roll, or they can be sent by express in a neat frame for immediate hanging on the wall, if desired. Arrangements have been made for putting them in such a frame at an expense of only sixty cents, including packing for shipment, wire for hanging, etc. The frame is of oak, with a gold band within. It is not a wide frame, but sufficiently so for the size of the certificate Kindly notify the secretary whether you will have it framed or not' and if framed enclose the expense.

INJURY TO MINNESOTA FRUIT THE PAST WINTER.—Reports received to date do not indicate any extensive injury to hardy fruits in our state from the extraordinarily cold weather of the past winter. Varieties of apple and plum trees not classed as "hardy" in our state have come out of the winter in very bad shape, but there is comparatively little of this class of stock been set here late years. Pears are largely dead and plums other than natives. Small fruits not

well covered are seriously injured, as a rule, though there are exceptions to this. Probably few growers of this class of fruit leave them without winter protection, and after this experience there will be fewer who will.

Some growers report apparent injury to fruit buds on hardy trees, and the crop may be shortened on this account.

On the whole the growers in Minnesota have suffered less, we believe, than those in the fruit sections further south. This severe winter has empathized caution in selection of varieties and care and has thinned out our seedlings some. We needed it, undoubtedly.

TIMELY WORDS FROM THE WOMENS'S AUXILIARY.—The Women's Auxiliary would suggest that the different "Improvement Clubs," throughout the state, make a strenuous effort to have the "Do and Don't" cards introduced into their schools. Ask the teachers to use one or more of the topics thereon as a subject for composition work. All the papers written, from all the grades, should be turned over to a committee of ladies from the club, who will select a half dozen or more of the best ones and have them read before a regular meeting of the club. This will be an incentive to the children to do their best. At the beginning of the next school year make arrangements to have an "experience meeting," for the schools, at which the children will take for a topic their experience in trying to carry out the requirements of the card.

If the boys and girls of the present day can be brought up to "Do and Don't" according to its teachings, we may rest assured that the next generation will be ready to take more advanced steps.

Apply to Mrs. J. H. Lewis, Hastings, Minn., who will furnish the "Do and Don't" cards.

ANNA B. UNDERWOOD,
Secretary Women's Auxiliary.

THE SOCIETY'S NEW PRINTING LAW.—As it is printed in this issue, it speaks for itself. It provides for printing the same number of reports that have been printed late years and appropriates "in perpetuam" a sufficient sum to pay for their printing at present prices. The bill was introduced by Hon. A. K. Bush, a member of the house as well as a zealous member of this society, and received his careful attention until it finally became a law, after running the legislative gauntlet for the best part of the session and passing the senate near its close. The passage of this bill developed a host of friends for the horticultural society in and out of the legislature—in fact, there was no apparent opposition. In the house no one voted against it, though the press reports four votes against in the senate, which report has not yet been verified. Much personal work was done in its interest by our president, and the other officers and the general membership lent their assistance most generously as asked for. It was not a bill easy of enactment, as it carried a deficiency appropriation, something the average legislator very much dislikes, and its practically unanimous passage speaks volumes for the standing of the society. In taking up the work anew on this permanent basis, it is our duty and aim to make it of still larger service in contributing to the public good.

RESIDENCE OF W. W. PENDERGAST, PRES. MINN. STATE HORT. SOCIETY, HUTCHINSON, MINN.
Buckthorn hedge in the foreground. (See Secretary's Corner.)

THE MINNESOTA
HORTICULTURIST.

VOL. 27. JUNE, 1899. No. 6.

CULTIVATION OF THE SQUASH IN THE FAMILY GARDEN.

J. S. JERABEK, SILVER LAKE.

At the outset I wish to call your attention to two things. First, when writing this paper I had in mind the soil and the climate of my neighborhood. The soil is a clay loam, the subsoil yellow clay averaging about twelve feet in depth, and the bottom blue clay. Although we are in the same latitude as this city (Minneapolis), our wheat crops mature on an average one week later. For the gourd family crop the difference is greater. Second and most important is this: I did not write near all I wanted to, because I have not learned the art of saying much in few words.

We should select high ground and sheltered from cold winds if we have such a spot on our place. One of the best manured corners of our garden will do very well. The reason why I say the best manured spot is, because we can raise much nicer and heavier crops of squashes in very rich soil.

Last winter I visited my friend near Hopkins, and he showed me a nice lot of large Hubbard squashes which he had raised. I asked: "How do you raise such nice Hubbard squashes? I can raise nice Marbleheads, Orange Marrow and other kinds, but Hubbards I cannot raise."

He replied: "Use plenty of good manure, and you will succeed.' He gave me seed, of which I planted one hill on a well manured spot, and the result was eighteen nice squashes, while before I used to raise on an average about three scrubby Hubbards to a hill.

It is advisable to plant the few hills which we need quite early in the season, at about the same time we plant our potatoes for early crop, as it is easier to protect the plants from late frosts, if they should happen to come, by covering them with wooden boxes, than it is to defend the small plants from the attacks of the striped beetle.

The winter varieties need all of the sunshine we can give them in order to be well ripened before the first frost, which quite often ends their growing period.

Generally we cannot depend upon raising a good crop of other vegetables with squashes on the same soil in the same season, ex-

cept the kinds that are ripe or ready to harvest before the squash vines cover the soil. For the same reason it is well to keep all of the weeds out until the vines take possession of the ground given to them. If we raise a good crop of weeds, we shall raise a meagre crop of vegetables.

We should decide which of the *best* varieties we want to plant and plant only *one kind* in a patch. For if we try to improve some strain by hybridizing, we are apt to raise a lot of worthless squashes. Let the state experiment station do the hybridizing or originating of the new varieties. We ought to be satisfied if we can by selection improve the varieties now in cultivation.

For summer and fall use the Orange Marrow is a very good kind; for winter use the Hubbard and the Marblehead are the best. I prefer the last named sort for two reasons: it is a good bearer and of extra good quality, besides having the hardest shell of the squash family, which protects it from being bruised when handled.

Let us always plant northern or home grown seed, and we shall not find a large per cent of our squashes are unripe when their growing season is over. Let us always store our squashes in a dry place—let it be dry not only above but even under them, and we shall be surprised to see perfectly sound squashes even late in spring.

Mr. Dewain Cook: Will pumpkins and squash mix?

Mr. Jerabek: Some of the squashes lose their good quality; they will not do so well if planted together, even if other kinds are planted several rods away. If there are plenty of bees around, they should be planted ten rods apart.

Mr. Harris: Yes, about three miles apart.

Mr. Reeves (Iowa): Will other squashes mix with squashes, melons and cucumbers?

Mr. Elliot: I have had considerable experience in growing squashes, and I find a large majority of the vine family will mix more or less. It is well if you want to save specimens for seed to plant them remote from any other vine.

Mr. Rideout: Would you recommend cutting vines back?

Mr. Jerabek: I tried that plan once. I cut part of the vine off those that had squashes on, and by doing that I raised on about a dozen hills two wagon loads of squashes. The place where I raised them was the site of an old straw stack, and I had to haul a load of dirt on the place before I could set the plants.

Mr. T. T. Smith: Last summer I drove out to the Chandler place. He makes a specialty of growing squash for the eastern market. He has a squash house where he keeps them until he ships them east. I think the building is about sixteen feet high, and there were racks made just far enough apart to place squashes on, so no two would rest on each other.

Mr. A. G. Long: Has any one grown what is called the "Japanese pie squash?" I presume it is so called from the peculiar markings on the seeds.

Mr. Jerabek: I raised a few, but they did not ripen.

Mr. Rideout: It is far superior to the common squash or pumpkin for pies. It is a very fine squash.

Mr. Long: From four hills I grew thirty-seven squashes, ranging in weight from ten to twenty-five pounds each, and I had no trouble in giving them all away. (Laughter). They make very fine pies, of a finer flavor and richer than pumpkin.

Mr. T. T. Smith: I would like to ask whether eight feet apart and ten feet apart between the rows is not too close. Whenever I consider the question of planting squash, it always recalls the squash I saw at Chicago in 1893. It came from California, and on the squash was a typewritten statement as follows: "This squash grew 853 feet from the hill. There were 877 squashes in one hill." (Laughter). I think squashes should be planted ten or twelve feet apart, although I do not believe they will grow to any such length in this country as they do in California, but in a favorable location they will grow to a great length.

Mr. Benjamin: I don't think the Hubbard squash will grow over twenty-five feet. I think we get the best results with squash somewhat protected; where the wind whips the leaves and blossoms, I do not get any squash. I have had good success raising melons by planting them in a rich compost.

Mr. Taylor: I would like to ask whether any one practices pruning when the plant is young. I find they do not fruit near the hill unless they are pruned. I practice cutting off the vines, and I get a great many squashes, but they are not large ones.

Mr. Long: I pruned the ends of the vines of those Japanese pie squashes I referred to a moment ago when the squashes were about half grown, and every squash that remained on the vine ripened. I have some in the cellar today apparently as sound as when taken from the vines.

Mr. C. L. Smith: That is the same thing as the calash.

Mr. J. E. Northrup: No, it is different.

Mr. Long: They grow somewhat in the shape of a club, some of them two feet long, the neck five to six inches in diameter and solid meat, while the blossom end is enlarged and contains the seed.

Mr. Benjamin: I think if the gardener had time to watch his vines and prune them at the proper time, he could not only ripen up his fruit better, but he would increase the yield also.

Mr. Rideout: If you do not cut off the ends of the vines, you will have immature squashes.

Mr. Elliot: The practice in forcing vegetables, especially cucumbers, in early days with me, was to pinch the vines when they got to be a foot long, and as they filled the frame I kept pinching until we got our frame full, then we let them fruit. I had an old English gardener who had been brought up and trained in the greenhouse

and forcing business, and he said that was the method that had been adopted in England, and he was very successful in raising cucumbers in that way. I do not see why the same plan would not work with squash and melons.

Mr. Bush: That is one of the secrets of growing squashes and melons. Plant not more than two or three in the hill, and then begin this trimming; it can be done with a corn knife, and if late fruit sets on those vines you can pinch the blossoms and mature only what you want. You will get better fruit, and it will be better matured and will keep better, and you will be much more successful in the long run. For keeping them in the winter they must be gathered free from moisture, and must be stored perfectly dry. Remember that when storing squashes.

Mr. Elliot: You would not advice keeping them at a high temperature, say about 40 degrees?

Mr. Bush: Yes, that is about the temperature in which they will keep best.

Mr. C. L. Smith: Mr. Jerabek spoke about his protecting boxes. What kind do you use, and when do you put them on?

Mr. Jerabek: Soap boxes will do, and I put them on when it looks like a freeze. I only raise about six hills, and I have twice as many as I can use. You can easily cover four or six hills in a few moments when it looks like a freeze.

Mr. C. L. Smith: What about the striped bug?

Mr. Jerabek: I never do anything for them except pick them off the vines.

Mr. C. L. Smith: I think I do better than that. Something like ten or twelve years ago, in the early days of the farmers' institute work, I made some boxes to put over my vines. I used some six inch fencing and made the boxes twelve inches square, covered them with unbleached muslin, and I found I could plant my squashes from the first to the tenth of May, and by using the boxes I not only protected against frost, but I protected against the striped beetle. I leave those boxes there day and night until the vines and leaves begin to push out and crowd the box, then I take them off. I never have any trouble with the striped bug. Three years ago I had a little patch of ground, just eight square rods. I had nothing else to plant in it, so I hauled two wagon loads of manure from the yard and manured that piece of land. I dug hills eight feet apart each way and threw about two bushel baskets of manure in each hill so the hill was full of it within two inches of the surface; then I planted seven to eight squash seeds in each hill, and when they were well up thinned them out to three in each hill. When nearly grown I clipped the ends of all the vines. I hauled the squash into the city and got $20.00 for two and one-quarter tons I raised from that eight square rods. All the cultivating they had was one cultivation with the horse and one hand hoeing, and then the vines covered the ground. I used the boxes, and they are cheaply and easily made. I culled out all the six inch boards from my pine wood. I found the twelve inch boxes to be a little smaller than they ought to be, so now I make them sixteen inches. I figure that the entire cost if

I use fencing would be less than five cents apiece, and I have some that I made in 1886, twelve years ago. They have not been used all the time, but some in the lot have been used every year, and they are still good. They are covered with cloth, and when we get through with them we just pile them up anywhere and, they are all right until the next year. They are a thorough protection against frost and against the striped bug.

Mr. Elliot: I want to put a clincher on that story. Eight square rods is one-twentieth of an acre, and if he got $20.00 for the two and one-quarter tons he grew that would be forty-five tons, which would be worth $400. We had better all go to raising squashes. (Laughter).

OLD TIME FLOWER GARDENS.

MRS. CHARLOTTE O. VAN CLEVE, MINNEAPOLIS.

Many years ago, when private grounds were enclosed by fences, flower gardens were carefully and successfully cultivated in this city, of which we are so proud, and they were very ornamental along our streets and by-ways.

The walks from gate to door were bordered by varieties of colored beauties; morning glories ran riot over our fences, and in some instances peeped into the windows of our sitting rooms; and it was pleasant to notice how men going to business, and children hurrying to school, stopped a moment to look at and admire the many hued beauties. As young men went by to their schools or desks, I could not but feel that these pretty things, fresh from the Great Horticulturist's hand, must exert a good influence, and to those who were away from home it may have reminded them of mother's teachings and father's prayer.

The fragrant mignonette had a place in our flower beds. It made no great show but was like a good life well lived, exerting a good influence very unostentatiously, and giving out a sweet fragrance that affects all who come within its influence.

Then there were the pansies, called by poets the "modest violet." These are great favorites; children love them, and mothers made a pretty story founded on them about a mother and her daughters; little folks are always interested in these pretty things, and before they can speak plainly, bring them to mother with the lisping appeal, "tell me pitty 'tory." Their name, "health call," is pretty and suggestive, and one can scarcely conceive of a more beautiful blending of colors or a greater variety varying through the different shades of purple and yellow and brown, to clear white.

Phlox drummondi was one of the stand-bys in a flower bed, and was very satisfactory. Portulacca was another pretty blossoming plant and very easy of cultivation; its crimson, white and yellow flowers continue through the summer and often come up in the spring from seed dropped late in the season. The Californian poppy, eschscholtzia, is a beautiful canary colored flower and blossoms freely all summer.

The pretty modest candytuft was a great favorite in those old

time flower beds, and was such a constant bloomer that it became a necessity to the home horticulturists of the days gone by. Ageratum, both white and lilac colored, was cultivated very generally, and the sweet alyssum was pretty and very useful in bouquets.

The aster, too, had a place in our yard gardens, and we sometime grieve that our facility for gratifying our horticultural tastes has been so much curtailed by modern improvements. But we realize that "passing away" is written on everything earthly, and we try to look forward and upward to that land of which the poet sings:

> "There everlasting spring abides
> And never withering flowers,"

and our hearts grow warm with gratitude to Him who has made so many beautiful things to cheer us on our way.

In every horticultural library should be found Sanitine's interesting story of "Picciola," which illustrates beautifully the effect of a single flower upon the Count of Charney, during his imprisonment for some political offense in the reign of the great Napoleon. The book should be in every horticultural collection, and one cannot read it without a feeling of love for Him who said of the lilies of the field that "Solomon in all his glory was not arrayed like one of these."

Mr. J. S. Harris: I wish to say to this audience that it is a source of great pleasure to me to listen once more to the words of Mrs. Van Cleve. Four years ago this summer Wyman Elliot took me to her place, and it did me good to see her flowers. It was often an inspiration when she came out to our meetings, and I am glad to see she was not forgotten by the society this year. It is my hope that she may live much longer to note the progress of the work she so much loves.

EFFECT OF COLD ON SEEDS.—Wheat, oats and certain grass seeds were chilled to 312 degrees below zero in liquid air and kept at that temperature for periods of varying lengths. They were then planted and the usual proportion sprouted. Other tests indicate that few of the harder kinds of seeds or grains are injured by freezing or by ordinary zero temperatures so long as they are kept in a dry place. Wheat known to be 3000 to 5000 years old, found in Egyptian mummies, has been successfully germinated and we believe matured its seed.—Ex.

PROFITS OF GROWING RED AND BLACK RASPBERRIES COMPARED.

C. W. SAMPSON, EUREKA.

From my experience in growing the black and red raspberry I find there is a little more profit in growing the red than the black raspberry, for this reason: nearly every year the red raspberry will bring a higher price in the market than the black, sometimes twenty-five cents a case more, sometimes fifty cents. I have known some years when raspberries were very scarce that blackcaps sold as well as the red. I think the red raspberries yield heavier than the black. There is a time when the first picking of the blackcaps is made that one would suppose they yielded more than the red, be cause they are entirely covered on the outside with fruit, but after two or three pickings the quantity will diminish, and they are soon gone, while the red will continue in bearing three or four weeks. I also believe the blackcaps require more care and attention, and it is more difficult to keep them clean. If they are put down for the winter, it is certainly found to be a more difficult task than it is to lay down the red varieties. Therefore, summing up my experience, I would say there is more profit in growing the red than there is in the blackcap raspberry for market, although I would recommend every farmer to have some blackcap raspberries. They are very fine for canning and for table use.

Mr. C. L. Smith: Have you ever tried the purple varieties?

Mr. Sampson: Well, I do not call them black. Some years they are very fine. The Columbia holds its shape well and is a nice berry.

Mr. Philips: Have you ever noticed that the birds prefer the Columbia to any other berry?

Mr. Sampson: Yes, I think they do; I have noticed that.

The President: Do you cover your red raspberries?

Mr. Sampson: Yes, everything but the Louden.

The President: How do you cover?

Mr. Sampson: We just bend them over and cover with earth. We lay them down, then take a plow with a long mouldboard, and plow them out of sight. They will do well sometimes not to cover them.

Mr. Yahnke: Does it not hurt the roots?

Mr. Sampson: I keep away from the roots. We use a long doubletree and the plow covers them clear out of sight.

Mr. Benjamin: Does it require a special kind of plow?

Mr. Sampson: A good breaking plow will do.

The President: What does it cost an acre to lay them down?

Mr. Sampson: I have never figured exactly what it will cost an acre, but I think it would cost about $6.00.

Mr. Bush: Have you ever tried the plan of using two plows, one on either side of the row, and fastened together, using a team on each plow?

Mr. Sampson: No, I have never tried that, but I think that would be a good idea.

Mr. Wright: What would be the advantage if you had to use two teams and two men to hold the plows?

Mr. Bush: It bends the bushes down as you go along and covers them at the same time. You save the labor of laying them down before you cover them.

Mr. T. T. Smith: Did I understand you to say that you bend the vines before you cover them?

Mr. Sampson: Oh yes, we bend them over and fasten the tips with earth before we plow them over.

Mr. Benjamin: What do you use in uncovering?

Mr. Wright: I use a fork.

Mr. Yahnke: Do you lay them all down one way?

Mr. Wright: We lay one row down one way and the next the other way. We take them up in the same way, because it saves walking back and forth.

Mr. Benjamin: Do you have any choice as to which way the rows should run?

Mr. Wright: My rows run mostly east and west. I do not know that it makes any difference.

Mr. Barnes, (Wis.): Is there any one present who knows anything about a new black raspberry called the "Trempeleau?" It is claimed to have originated near Trempeleau, Wis. It is being boomed by one nursery.

Mr. C. L. Smith: Philips ought to know.

Mr. Philips: He ought to know lots of things he doesn't know.

Mr. Yahnke: I heard one of my neighbors speak of it as a pretty good berry.

MUSHROOM GROWING IN THE FIELDS.—Wet places in the woods are not suited for mushroom growing, as the spawn would be apt to rot before sprouting. Rich, old pasture lands, not too dry and not too wet, are best. About the middle of June, with a sharp spade make V-shaped cuts in the sod, about four inches deep, and raise one side enough to allow the insertion of a piece of spawn, two or three inches square under it, so that it shall be about two or three inches below the surface, then tamp the sod down. Make these plantings three or four feet apart, and if the season is favorable, a good crop should appear the following August and September.

INSECTS AFFECTING CURRANTS, ETC.

A DISCUSSION.

Mr. Hartwell: How does the saw fly deposit its eggs?

Prof. Lugger: The saw fly formerly split the midrib on the leaf and inserted its eggs, and the moment it came in contact with the sap it would swell up. Our saw fly that is so destructive no longer has such a habit. Instead of going to the trouble of splitting the leaves, it simply lays the eggs along the ribs on the under side. We have a saw fly with a saw which it does not use. We find it has a saw blade, but by not having used the saw for many generations it has lost the teeth. At one time every saw fly had the same habit, but by being assisted by man in growing lots of food they do not go to the trouble of laying eggs in that way any longer. We have two generations a year at least in most places, and the worms are easily kept in check, much more so than other insects. They are readily killed by an application of anything in the form of poison that kills by contact. The smallest amount of hellebore will kill insects that belong to the saw fly order, while it will not kill many other insects. It is simply an excellent remedy against saw flies and their close relations. You can use it either wet or in the form of powder; it depends on the number of bushes you have to spray. I prefer to use it wet as a spray, so that every part of the plant can be reached. It kills by contact and poison. It kills by contact in the most curious way. As soon as you touch a worm with the smallest amount of it, it will squirm and act as if it was paralyzed. It drops to the ground apparently not hurt, but it is unable to get back again to the plant. If the hellebore does not come in contact with the worm, the worm dies from eating the material on the leaves. Hellebore is poison to insects of that kind. As far as saw flies are concerned we should not be bothered with them; they are easily killed, but they should be killed in time. The trouble is we kill the first generation when they are apt to do injury, but after we pick the fruit we let the second brood go, and they have a chance to multiply for the next year. The second brood should be poisoned just the same as the first. Chickens and other animals will not eat worms of this character. I have starved chickens for more than a day, and they have refused to eat the worms. I tried to find out why it was that where chickens had the run of the bushes there were not many worms, and I found it was the constant passing among the bushes and shaking them, causing the worms to tumble to the ground, when it is almost impossible for them to again get back on the plants; they usually starve on the ground. To satisfy myself that that was the case I tried several experiments. I took a rope and had a boy at the other end; we would stretch the rope along a row of currants and shake them, throwing the worms to the ground, and after two or three applications I found the plants were entirely free from worms. They were unable to reach the plants again and died on the ground. So this insect is easily kept in check if attended to in time.

Mr. Tomlinson: How do you use that hellebore?

Prof. Lugger: Just take a handful of hellebore and a bucket of

water. Mix it to a sort of a paste in a saucer with a little water and then add the water. If you use it dry mix one pint with twenty-five parts of flour and put it on with a blow gun. I never make more than two applications.

Mr. Ellergodt: How much will it take to spray an acre? It would be rather expensive.

Prof. Lugger: It should not take more that 25 cents worth to spray an acre.

Mr. Crooker: Is there not a parasite that destroys the currant lice?

Prof. Lugger: Last summer we had a great number of parasites that destroyed these lice. When you find on the body of a louse a sort of a grayish sack, and you watch it carefully, and put it under glass a couple of days, you will find there is a little round ball inside, and out of the inside of each egg comes a beautiful black wasp. These black wasps lay about 600 eggs, and the progeny will lay eggs in 600 other lice, and the lice will all be killed off by the parasite. If you ever see such a thing, and you frequently will have opportunity to do so, do not destroy the lice. We had the same thing this year with cabbage lice, and in four or five days the cabbage lice were all gone.

Mr. Hartwell: Did you give the life history of the saw fly? How long does it take the egg to hatch?

Prof. Lugger: It depends upon the weather. They remain during a cold spell ten or more days, but if we have normal conditions, sunshine and warm weather, they will hatch in five.

Mr. Hartwell: How many forms do they take?

Prof. Lugger: As soon as the worm is full grown it drops to the ground. It enters to a certain depth and spins a silken cocoon. It is perfectly safe there. On the inside of that it changes to a pupa, which soon after changes to a saw fly. The second brood of larvæ goes into the ground, but they do not hatch until the next year. Some years ago I went to the expense of nearly a hundred dollars to buy living parasites to kill the large saw fly that is so common in our windbreaks, that eats the willows and bushes. We discovered in Dakota some parasites that would kill this fly, and I planted them in a windbreak. On going down there some fourteen days later I found that the ground about the roots of the willows looked as though it had been plowed. It was all dug open, and I found the hogs had got to work and eaten the worms. But we have a still better friend in the skunks, if we can have them in our gardens. They are our best friends, and you should take proper pains to protect your chickens, and the skunks ought to be permitted to live. If the chickens are in the open where the skunks can get at them, they will, of course, prove a temptation. The whole value of chickens in the United States is not one-half as great as the benefit we derive from the skunk. That seems to be a rather tough statement, but it is based on facts. Then, too, we have a great number of peculiar mice. They simply have the shape of mice, but they are not mice. They have very little noses, and the eyes are so small that they cannot be seen unless the skin is held up against the light. If you see such mice, keep the cats away from them and protect them as much

as possible. Another thing, try to induce as many birds to nest in your grounds as you can. For gardens there is nothing better than the common house wren. It is a bird that is very easily attracted and can be so easily accommodated with a small home. You will be astonished to see how many worms they will eat. I had during the summer eight houses arranged to accommodate the house wren and raised in those eight nests about sixty young ones. The old birds were flying at the rate ot two trips every five minutes to bring food to the young birds, and they kept that going all summer long. The flight of a wren is only over a very short space, so most of that food has be taken right from the immediate neighborhood of their nests. The wrens will never eat the fruit; they eat nothing but insects, and when they are pressed for food they will search for lice.

Mr. Hartwell: Would you recommend the sparrow?

Prof. Lugger: I was opposed to the sparrow when it was first introduced in this country, and I was called the "sparrow crank." Yet there is something to be said in favor of the sparrow. Last year I was in Europe, and I investigated the food habit of the sparrow; I watched them with a great deal of interest, and I found in Europe they were not such a pest as they are here; they do a considerable amount of good there. In Europe on the apple trees, and on the pear and plum trees they have a very minute snoutbilled weevil, and they make it a business to sting the young forming fruit, which in consequence drops. The sparrows have the habit of investigating the flowers to find that insect.

Sec'y Latham: Could we not have that snoutbill introduced here? (Laughter.)

Prof. Lugger: We do not have those snoutbills here, and yet the American sparrow still searches for insects that at one time his great-great-great-grandfather used to eat in Europe, and in searching for those insects they pick the flowers all to pieces, and that is where the damage comes in. I have seen in Maryland flowers all picked to pieces by sparrows in searching for something imaginary.

Mrs. Stager: Will the Professor please give a description of the houses he builds for his wrens.

Prof. Lugger: I go to some potter and let him make a nice little house with the roof flush on the back so I can hang it against a tree. The opening is made so small that a European sparrow can simply look in and scold, but he cannot get in. There is a little step so as to give the wren a chance to crawl in. The house must be large, because it has a very peculiar habit of building its nest. You would imagine he was bringing in kindling wood for the winter. He brings in sticks about the size of a pencil and then he builds his nest.

Mr. Bush: Would it not be well to have different openings?

Prof. Lugger: I hardly think so. They are very pugnacious and would fight.

Mr. Hartwell: We had some in little marten boxes and the wrens would fill in all around the holes with little sticks across them.

The President: I have a lady friend who thinks a great deal of the wren, and she uses cigar boxes, and the wrens occupy those. She has a beautiful specimen of a nest. After the wren had used the nest she opened the cover of the box, and she has the nest showing it just as it was used by the wren.

Mr. Tomlinson: Where gentlemen do not use cigars, a peach or tomato can will answer the purpose, and one year we found some in an old wooden pump. They will accommodate themselves to circumstances.

NATIVE TREES, SHRUBS AND VINES FOR ORNAMENTAL PURPOSES.

PROF. D. LANGE, ST. PAUL.

It has often seemed to me that amongst our many beautiful wild flowers there must be quite a large number that it might pay the florist and hortculturist to improve for ornamental purposes. What little has been done along that line has certainly not been sufficient to make the cultivation of these plants popular or even common This brief paper is restricted to the discussion of a few woody plants that seem to me to possess some value for lawns, gardens and parks, but which are seldom seen in cultivation.

Nothing rivals the beauty of our scarlet oaks, Quercus velutina on the autumn landscape. In one grove you may see green, yellow, crimson, dark red and brown. If there are some white oaks, Quercus alba, and red oaks, Quercus rubra, mixed with the scarlet oaks, the effect is still more striking. It seems to be a common opinion that these oaks will not endure on a lawn. It is true that they often die in such places, but my observations show that this is usually due to a lack of moisture and sometimes to injury caused to their roots by building operations.

Another native tree that should be much more planted on account of its truly gorgeous autumn foliage, is the sugar maple, Acer saccharinum. Often you can see a tree shine in a bright golden yellow, which is tinged with a delicate red. No painter could let one color run into the other more skillfully than nature has graded her tints on this splendid native tree.

The only native vines at all common around our homes are the Virginia creeper, Ampelopsis quinquefolia, and the wild grape vine. All the different species of sumach except the poison sumach, Rhus toxicodendron, deserve a place near our homes, on account of their foliage and their showy fruit. The large pinnate leaves are conspicuous even in summer, but are truly beautiful when the first frosts have painted them red and crimson.

In Europe I have seen our sumachs in parks and gardens. We allow them to grow in the woods only. Instead of native shrubs and vines we plant some Siberian or other foreign species, whose points of merit seem to be sometimes about the following:

1. Some nurseryman was able to sell them to us.

2. There is nothing beautiful or even strikingly characteristic about their flowers, their buds, their fruit or their mode of branching.

3. We don't know their names, but we know they are imported.

Allow me now to call your attention to a shrub that has always attracted me on my winter rambles by the beautiful red of its twigs and branches. I refer to the red osier, or kinnikinnik, Cornus stolonifera, which is common everywhere in wet places. Along roads, in parks, near garden fountains, this hardy shrub grows very readily, and it is indeed an eye-treat in winter, when white, black and grey are about the only color nature presents in abundance.

Another plant I always enjoy to meet in winter and summer, is a twining vine, the moonseed, Menispermum canadense, L. In summer its large five to seven angled leaves attract me, and in autumn and winter I admire the large clusters of conspicuous black berries. The vines are very much eaten by rabbits and smaller rodents, and should be protected from them in winter, or most of the vines will have to grow from the roots each year.

Another beautiful vine which is frequently found near the moonseed is the hispid greenbrier, Smilax hispida. This vine climbs high by means of tendrils. It has beautiful glossy leaves, which remain green and stay on the twigs until very late in autumn. The black berries remain on the bush all winter. It has the lower part of its vines amply protected against rodents by thickly set prickles. As far as I have observed, it seems to prefer warm, moist places.

I shall conclude with a few plants whose ornamental value is in their fruit. Many people seem to be somewhat familiar with the virgin's bower, Clematis virginiana. But I have to go to the woods when I wish to see their beautiful woolly seed-tufts spreading out over bush and brier. Still more ornamental is the fruit of the wax vine, or false bittersweet, Celastrus scandens. When you behold the clusters of its red fruit on the snow, or mixed with brown oak leaves or green pine needles, you cannot fail to gaze with delight upon these bits of color in the sear winter landscape. The vine is not at all fastidious about localities. I have found it on hot sunburnt cliffs and in cool shady gorges and in dense fertile woods. I know some that twine around oaks and hickories, and others that have climbed to the top of a young white pine. The fruit sets best in open places and is retained all winter.

The shrub, however, that bears our most exquisite flowers of autumn and winter is the burning bush, Enonymus atropurpureus It is a shrub or small tree from five to twenty feet high, with a well marked main stem. The small flowers are of an odd dark purple color. The fruit begins to color when the leaves begin to fall. This year they were at their best about November first. The outer covering was then of a most exquisite red, and looked like fine velvet, although it is not covered with hair of any kind. Through this husk project bright crimson seeds. The whole fruit is pendulous on their stems about one and a half inches long. The shrub is fairly common in rich river bottoms. On the Ft. Snelling Reservation I know several little groves of them. I know of only one culti-

vated bush in St. Paul. If you unexpectedly come upon a grove of these shrubs displaying their autumn flowers in a thicket near the river's edge, as I have found them, you will admit that in color and in delicacy of form they are the rarest beauty of the autumn woods.

None of the shrubs and vines briefly described in this paper are poisonous; all are perfectly hardy, and their cultivation should receive much more attention.

Mr. C. F. Gardner, (Ia.); I would like to state that I consider the last two papers that have been read as interesting, to me, at least, as any papers I have heard here during this session. I think it is a good plan to try to have our people understand that it is not best to neglect our own native trees and shrubs and go to hunting around foreign countries for something to take their place. Let us set home trees out, native deciduous trees, evergreen trees and shrubs that are practically adapted to almost any situation. In regard to the oak, I could not quite understand what was meant, but I understood this much, that it was a fact that once in a while the oak would die. It might be well to call the attention of the members of the society to the fact that the oak generally is quite sensitive to the ground being trod upon, and I have never yet seen an oak tree that died apparently from any cause but what if a careful examination was made that that was found to be the cause of death.

Mr. C. L. Smith: We are a little ahead of St. Paul; we are using the shrubs Prof. Lange describes for ornamental purposes. I have been asked the question many and many times during the past few years: "What shall I plant for a hedge?" I said: "Take the red osier; get the little clumps that are growing around the marshes." There are hundreds of clumps of red osier growing around our marshes, and those that have tried it think it is the nicest thing for a hedge they ever saw. Bittersweet grows clear up to the Canadian border, and grows on any kind of soil. The professor forgot to mention that it has the finest foliage of any plant growing. It has rich, glossy leaves, makes a very rapid growth and is very nice to run around a porch or a trellis. The moonseed, I will say, responds very heartily to cultivation, and the leaf increases in size in proportion to the richness of the soil and the depth to which it is stirred and the thoroughness of the cultivation. I have some pressed specimens of moonseed leaves that measure eight and three fourths inches across. I have some trans-

planted in boxes that measured over six inches in diameter and attracted a great deal of attention. The vine is perfectly hardy, grows in sand or clay soil and in the gravel of railroad tracks, so that I consider we should certainly plant these wild vines for ornamental purposes instead of spending our money for vines secured somewhere else. I have noticed this bur oak in different places about the state, and it is the one tree that blue grass never kills.

Mr. Benjamin. There is one plant that was not mentioned, and that is the buckthorn. It can be trained to any height, and it makes a beautiful hedge. I think it is one of the most beautiful things for hedges we have in the northwest. A great many have set out plum trees in hedge row for a windbreak, but they make a very unsightly hedge, and they are also very disagreeable in that they come up from the root, but the buckthorn does not sprout from the root like the plum tree. You can plow and cultivate right up to your hedge, and you can cut off all you want to, it will never come up from the root; it can only be grown from the seed. Prof. Pendergast has a beautiful hedge at his home in Hutchinson.

Prof. Hansen: In going over the earth I found there was no plant more generally grown than the Virginia creeper. You will find our Virginia creeper in festoons in private grounds, cemeteries and parks, and you find immense archways and pillars, in fact, I found it used in a great number of ways, the like of which nothing can approach in the United States. Others know how to use the Virginia creeper to better advantage than we do. In that case the saying is true that "a prophet is not without honor save in his own country." Of all ornamental plants planted there, it is the most honored. They take all they can get from us, but if we were to take only that which comes to us from Europe we would not have much left. My idea is that we should get all we can from river banks, from the woods, from the prairie country, all we can of the native species and all we can anywhere else. We want to search the world, we want the earth. It is the idea in all our fruit work, in all our ornamental work, in all our tree work, we want only what will stand our climate. We ought not to confine ourselves to native species, we want the earth. (Laughter.)

Prof. Lange: There are a number of other species I did not mention, not because I forgot them, but I understood I was only to have a short paper. The so-called thorn apple I believe would make a good hedge plant. I do not know to what extent it has been tried. There is also a native crab apple that would make a nice hedge. There are also the dogwoods and other native plants. At the Philadelphia exposition the former received a prize. It grows wild in our state. It has an umbel of unique, rich colored flowers. I think it would improve with cultivation. I mentioned simply a few native vines and shrubs. Another good shrub is the bladderwort. Some of them have large triangular seed pods that remain on after the leaves have fallen and present rather an odd appearance.

THE SHELTER BELT AS A FACTOR IN STOCK GROWING.

O. C. GREGG, LYND.

Before I say a word upon the topic assigned me I would like to make this suggestion: We all differ in our methods because we differ in our individuality, but I want to express myself strongly in favor of growing trees on the land, and trees alone. Do not make this mixture of corn and potatoes. I want also to speak in favor of the Planet Jr. horse hoe. Perhaps you all use it. It is a perfect godsend to me, for it will just cut the soil about one and one-half inches deep, and it is marvelous how much work a man can do with it in a short time. When labor is so high we find a decided advantage in using those labor saving implements. I wished for something of the kind, and I thought perhaps I could invent something, but one day I happened to run across just the thing I wanted in an implement house, and I have used it ever since. I think I was born with a hatred for weeds. They taught me that weeds came from the devil. I have heard men say it costs too much money to keep the land clean. If you kill a few weeds today and then let them go a few days longer, you cannot do anything. It is the cheapest and best way to follow the old adage, "Whatever is worth doing at all is worth doing well."

Now a word about this topic, "The Relation of the Shelter Belt to the Stock Grower." I shall speak as a farmer in southwestern Minnesota, but what I shall say will apply in part to the whole state. I am satisfied we have been doing many things for years simply because our forefathers did them in the east where we came from. I have done dozens of things every year that I will never do again simply because I had become accustomed to doing them. What success I have had has been due to studying different conditions and trying to adapt myself to those conditions. Nature is a bad teacher. I am taught that lesson on the prairies where I have been for thirty years, and where the winds blow just the same as they did thirty years ago, and every month has its peculiar gale. When my friend was speaking adversely to the willow I could not help thinking of the willow hedge I have at home. It has stood up against the south wind for nearly thirty years, and today it stands just as upright as ever, and when the wind blows hard it bends and bends until its head almost touches the ground, and when the wind goes down it comes straight up again although it has lost a part of its head,

Now to the central thought. Study conditions. In the east we had an abundance of rain and snow, and it became a necessity that our stock should be confined to the stables. In the arid country they can turn their stock loose in the winter; they do not have to protect as much as in the east. We are in western Minnesota, or just between the two places, and we must learn to handle our stock on both the eastern and western methods. The stock in the east was burdened with one thing, the sense of confinement, the sense that men get with slaves. Mental attitude has much to do with growth. It is the same with the beast, and the more liberty we can give our stock the better they will thrive. We can give them liberty only to a cer-

tain extent because we must protect them against hard storms. With money comparatively cheap at the present time, labor is the great factor, and the consequence is that we want to so handle the cultivation of our crops with the implements we have that we shall have a minimum expenditure for labor.

Let me call attention to the stock foods. The corn plant, how we can grow it! How easily we can grow corn, and in growing food for stock the corn field is the best proposition. I want to say a word right here in favor of an implement that has recently come into use and has come to stay, and that is the corn harvester. You cannot afford to go out and cut corn a hill at a time, but you take a corn harvester and sweep over ten acres a day. Then they are making machines now by which you can throw a rope around a shock and lift it bodily upon the wagon. This corn I know I can put into shock and then haul it wherever I want it in a sheltered place to feed ton for ton cheaper than you can handle hay.

Take the sheep. Notice their characteristics. One thing is this: they are well protected with wool; they do not want to go into warm stables; they like freedom. You confine a sheep, and it will shed its wool. Give him fresh air, do not let the wind get at him and give him cornstalks, corn and all. I notice in the litter how clean everything is taken up. Give them a dry position, dry ground. Prof. Greenley just scatters it on the ground. There is a world of meaning in what my friend Theodore Louis says, "They eat in quietude." It did not surprise me yesterday to receive a letter from my man at home in which he says, "The sheep are fairly thriving."

Oats cut early, cut before ripe and put into to stack make an excellent food. It avoids the cost of the threshing machine; they do not shed and keep green and nice. It is a wonderful food. We know something of scientific farming. They have got to have a heat food, and corn and oats. How nice it is to have those foods. It is only now and then we want shelter for our sheep. When we have severe storms we can pack them together for a few days. They are confined a good deal like human beings on a vessel, and they will stand it very well for two or three days. As soon as the storm is over they are in the open. They must, in the west, sell their stock in the fall. The stock we have got was bought in the west, so we can take the stock and feed it, and, as Prof. Shaw has said, we do not have to build expensive barns.

The trees are friends of the farmer in the west. In most cases we want an enclosed shelter from the driving storms and blizzards, and I want that shelter surrounded by trees. What experience I had in that line in the early years was a valuable lesson to me, when I had two tunnels thirty feet long through the drifts and carried water to the stock in the sod stable, a pailful at a time. Do you wonder I love trees and hate treeless farms?

As to the different classes of stock. A few words about steers. They are much like the sheep in that they will stand cold. Cold is a stimulant to appetite. They do not need a first-class shelter,—and here is another thought I want to give to you; what we want is decayed vegetable matter. If there is anything I hate around the barn it is a cornstalk. We drag our corn out into the pasture, the stock

cleans it up, and when we want to turn the sod under it is out of the way. When we have to keep them in shelter we feed them there only a few days, and then we put them in the pasture, and in that way we avoid the cornstalk trouble.

Dairy stock. You all know how I feel about that matter. One trouble has been the confinement of the cows. Here is the young stock. How can we raise good young cattle and horses and keep them confined, and how many times do we see young stock confined in the stables and not let out for air or water until spring?

But my time is more than up, and I have barely given you a few thoughts on the subject. But I have outlined the thought, and that is that our success is connected with the tree, the shelter for our stock and for our homes, and if we heed the admonitions of nature in this respect we shall have a fair measure of success. (Applause.)

Mr. Clark: Mr. Gregg says he has no stables to protect stock against storm. Would he not have to arrange so as to feed them to a certain extent?

Mr. Gregg: We have it arranged so we can feed them, and they are provided with shelter against storms. The cows must have stable protection, and in bad storms we want to be able to give feed and water to all the stock under shelter.

Mr. Clark: Would you have them sleep in those stables all winter?

Mr. Gregg: The steers stay out all winter.

Prof. Pendergast: I do not want to oppose your right to willows around the outside of evergreens. I was confined in my remarks to evergreens. I looked down the list a little further, and I thought others would handle the deciduous trees. But I believe in a snowbreak on the outside of the evergreen, and then on the inside you will have a better protection for smaller trees. I have one Wealthy tree that bears more than all the other Wealthy trees I have, and that is on the north side of the house and within the shelter of it, and it runs up twenty feet before it gets above the house. It has the most beautiful apples I ever saw. On the south side I had some Malinda apples protected by the south side of the building, and every one of those died in a few years.

Mr. T. T. Smith: Mr. Gregg speaking of stock recalls a visit to Mr. DeGraff's farm, where he had several temporary sheds in the forest. He had cut out squares and kept his stock there.

Mr. C. L. Smith: Twenty-four years ago he fattened a lot of shorthorn steers and claimed he made a nice profit.

Mr. Gregg: The idea is not to keep them out all the time; give them shelter when they need it.

Mr. T. T. Smith: He had his sheds open in the front and had his hay put up with rails.

Mr. Gregg: I saw it and thought it was cruel, but, I declare, the man was doing better than I knew.

BLIGHT.

A DISCUSSION.

Mr. Barnes, (Wis.): In our section of Wisconsin, between two or three hundred miles east of here, there has not been one-third the blight there has been the past four or five years, owing to some extent to having weeded out the blighting varieties and other reasons on which I am not posted. Whether it was owing to the moisture in the soil or owing to the dry season, I cannot say. Everybody interested in trees should avoid growing those varieties that blight.

Mr. Yahnke: I have been troubled a good deal with blight for a few years, especially on my Transcendant. I trimmed them at the roots; I grubbed them out. On all the other trees, the Tetofsky and the Duchess, there was more or less blight, and I went to work and cut off every limb just as soon as they began to blight. I do not know whether this was an exceptional year or not, but I noticed that this year my trees were free from blight, but I have worked for five years to keep the blight out. As soon as a tree shows a bit of blight I cut off the limb. This blight is on the new growth of the limb, and I believe it can be carried further by birds. It grows on the end of the new growth, and it is a fungus that gets down on the limb and can be spread in favorable weather by birds that sit on the limb and by the wind. I think if horticulturists in a neigborhood could get together to kill out the blight, take some united action in that direction, it would accomplish the purpose, and we could get rid of it altogether.

Mr. Barnes. I trust it is not out of place to discuss the question of blight at this time. I think we have struck one of the key notes right here, and if we do nothing further than to discuss this subject of blight, we will derive great benefit. It is a fact that blight is disseminated from one tree to another, as this gentleman says. I have noticed that blight travels from east to west, and it is more contagious in the warm, southeastern winds than in any other. If we do set ourselves to work to eradicate the branches of trees as soon as we see a sign of blight appear, we can almost always check it. My system is that as soon as I see a tree begin to blight I cut it back into the green wood and burn it immediately.

Mr. Bunnell: Is there not more blight in very moist weather than in a dry season?

Mr. Barnes: We have had less blight in our section this season than we have had for years, and we have had more rainfall this year than for three or four years previous.

Mr. Philips, (Wis.): I have been looking for information on blight for twenty-five years. I want to ask this question: If it is contagious and is carried by winds and birds, why of two Wealthy trees, standing side by side, subject to the same wind and sun, planted in the same soil, one always bears apples, and a lot of them too, but it will blight and blight badly, while the other without fruit has no blight at all?

Mr. Barnes, (Wis.): The tree that has no fruit has more vigor to resist the blight.

Mr. Philips: I think it is the lack of vigor more than any one thing.

Mr. Reeves, (Ia.): I think Mr. Philips asked why the tree bearing apples blighted while the other did not. I think the answer given is satisfactory. I have two trees situated the same, but in my case the tree not bearing any fruit blights, and the other that bears fruit does not. Why is that?

Mr. C. L. Smith: He talks about one tree growing stronger than the other; that is just the reason why it happens to blight. I think there will be no dispute among us fellows in Minnesota that the strongest grower is disposed to blight. The strongest, most prolific bearing tree is the Transcendant, yet it blights the worst. It will stand more growth than any other tree.

Mr. Dartt: I think in Minnesota we have discussed the blight question about all that is profitable to discuss. I think every one has become satisfied that certain varieties are blighting kinds. They are subject to blight and are liable to blight, and they are not worth cultivating, and we have so many varieties that are not likely to blight that we should tie to them and let the blighters go.

Mr. Yahnke: This blight question is understood by horticulturists; we have been at it for the last ten years. The way to get rid of blight is to get rid of those trees that do blight, cut them out root and branch. It is an established fact that this blight may be carried from one tree to another, and why one tree gets the blight where another does not is because the latter is more resistant against it. So in the same varieties of trees under the same conditions one tree may not be so strong in one point as another. We have an acre of trees in the same locality, but each tree in that acre may possess different characteristics. There may be some nutriment in the tree or in the ground that strengthens it to resist this blight. There may be some other circumstances. There may be some difference in the air; one tree may have more shelter than another; the air may be more moist or more close, while another tree may stand where there is a free circulation of air. Therefore, we have got to watch our orchards and apply the remedy in the beginning, as one ounce of prevention is better than ten pounds of cure. We have got to look in our neighborhood, not only in our own orchards, but if we find our neighbors are neglecting their trees let them know the dangerous nature of blight; they will soon learn that it is dangerous. If they have not got ambition enough to do it themselves, do it for them and show them that the blight ought to be cut out and that it is killing the tree. If a neighbor has any head on him he will cut it out himself.

Mr. Benjamin: Agents have been spreading the statement around our country that the budding system was superior to the grafting system because it was a remedy for blight. I would like to ask if any one has tried the budding system over the grafting system for blight?

Mr. C. L. Smith: It makes no difference.

Mr. Kenney: About twenty-five years ago I sold quite a large orchard in Idaho. Among the trees were Transcendants, Hislop,

General Grant and other blighters. I saw the man recently who bought the trees, and he told me that there never has been a blighted limb on any of those trees, and yet out of the same lot were sold trees in other localities, and they are nearly all gone. I think it is on account of climatic conditions.

Mr. Hartwell: There was a paper read in our association (the Illinois society), by Col. Forbes, on pear blight, and I recall this illustration of his experimental work: He had a large pear orchard, and he worked three tests on it, and one was that he thoroughly cultivated certain rows and left uncultivated and in sod other rows. The rows cultivated blighted almost to kill while those uncultivated did not.

Mr. Seth Kenney: I would like to ask why that orchard in Idaho did not blight.

Prof. Green: Mr. Hartwell recalls Col. Forbes' experiment with one row of trees in sod that did not blight. I remember in New York carrying on an experiment for Prof. Penhallow for prevention of the yellows in the peach, and the line of experiment was in using fertilizers, and wherever we used a large amount of nitrogenous fertilizer we would get blight. Phosphoric acid would encourage early maturity and hardiness, and while we were in a measure successful, yet I do not think the test was conclusive.

Mr. Patten (Iowa): As to the effect of budding a tree to prevent its blighting. I made certain experiments with a tree that is known as a blighting variety, in budding it with a Duchess. I budded it just above the surface of the ground, as it is usually done, and to my surprise those budded trees have blighted very badly. It is the only place where the Duchess of Oldenburg has blighted to any extent.

The President: I do not think any of us can say definitely what causes blight and what will prevent it. I do not think that question has ever been answered, but it does seem as though climatic influences have something to do with it. That is the reason why I introduced the inquiry whether there has been as much difficulty experienced this year as in previous years. Where I have made my observations this year there has been no blight on blighting varieties of trees, and I came to the conclusion it was because the season was different owing to climatic conditions, and I think what Prof. Green has said and what Mr. Kenney has said indicate the same conclusion.

Mr. Dartt: I think one point has been overlooked. High cultivation of an orchard always induces blight. Always. I can make that as a positive statement. Anything that induces rapid growth will be most likely to cause blight.

The President: In a large experience in growing trees I have found just the opposite to be the case. There is no condition of trees you can mention under which blight will not occur. Whether you mulch or not, whether you cultivate or not, whether the trees are in sod or not, I have never seen any condition in which they do not blight. I have seen trees in the nursery that were root-killed that blighted badly, and I have seen trees in perfect condition, with

everything present to indicate they were in good condition, and they blighted badly.

Mr. Philips (Wis.): Did you ever see the Northwestern Greening blight?

The President: I have not grown them long enough to find out. I have seen the Duchess blight, and I do not consider that a blighting variety.

Prof. Green: Would your trees blight worse when not cultivated than when cultivated?

The President: They would blight under every condition. I was just positive I knew why my trees blighted, but I found I was mistaken.

Mr. Gregg: Do you think they will blight as badly where there is a thorough circulation of air as where they are subjected to more moist influences?

The President: I have had them on high, rolling prairie soil, where all the conditions were the most favorable I could possibly get, and I never had a worse case of blight. There is no condition I could imagine where blight cannot exist.

Mr. Bunnell: Judge Woodbury set out his trees in an old orchard, and nearly every one of those trees were blighted badly. I laid the cause to the fact that he planted them among those old trees, and there was very little circulation of air. If he had set them away from the large bearing trees where there was more circulation of air, they would not have been subject to blight.

Mr. Philips (Wis.): After Mr. Peffer was taken sick and expected to die he sent for me. He wanted me to take a pear tree he had on his place and propagate it because it was entirely blight proof. He took me out and showed me the trees (he died six weeks later), and I took them home, six of them, and I planted one of those trees near a Transcendent tree, and I planted another near a Sylvan Sweet tree, and that did not blight for two years, but the one I planted near the Transcendent blighted and died to the ground the year it was planted.

The President: There is no doubt but what blight spreads from one tree to another, and the best thing to do is to avoid the blighting varieties. I believe climate has some effect on it.

Mr. Barnes (Wis.): I did not come here to advocate the Northwestern Greening, but on that table (indicating) there are specimens of that apple that were grown within fifteen miles of the old Northwestern Greening tree. The circulation in the orchard is not very free, and I got a good many that are specked like these. The old original Northwestern Greening tree does not show any blight. My three hundred trees have never blighted. Once in a while I have seen a little twig blight, but I have never had a Greening that blighted.

Mr. T. T. Smith: Did I understand you to say that those large apples and the small ones grew on the same tree?

Mr. Barnes: No, I said they grew in the same orchard. These large apples grew on the outside row, while the others grew where there was less circulation of air. We must give the Northwestern

Greening and the Wolf River twice the room we give other varieties.

Mr. Philips (Wis.): They ought to be planted thirty-five feet apart. Mr. Barnes has his sixteen feet, and they are so close a man can hardly get through.

Mr. Barnes: I would plant the Wolf River about thirty feet each way.

Mr. Yahnke: Mr. Dartt says manure and high cultivation will induce blight. My experience showed me the reverse this year. I manured my orchard very heavily this year and got no blight at all. I manured it the year before, last year and this year.

Mr. Benjamin: There is an orchard not far from our place where the trees are set on a flat ridge with not more than a foot or fourteen inches of soil above a gravel bed. There is not a sign of blight on those trees; they are Transcendent's and other varieties. I drove around the orchard to see. I have wondered if we had that system of underdraining the soil, if we had the gravel, whether it would not be a benefit. I thought it was very poor land, but I have noticed several orchards in the same condition.

Mr. Patten (Iowa): Is there time for a few minutes more? I wish to say that in our discussion of this question we are overlooking a valuable and practical point we ought to bring out. The fact is, according to my experience, it does make a very great difference whether you enrich land with strawy or rank manure as to whether you produce blight in trees, either in orchard or nursery. For a number of years I have had experience with prairie land where there was at one time a straw stack, and for years afterward that land was cultivated to corn, oats and wheat, and different kinds of crops, and this stack had been placed on an elevated ridge of land. If there was any spot in the whole field where it would be supposed trees would not blight, it was on that ridge, and that was the only spot, except one, on the place, in a large block of trees, where any considerable blight developed, and it was very marked in the region about the straw stack. In another case I manured a piece very thickly with barnyard manure, and afterward planted Whitney No. 20, and they blighted to death. If we apply our manure in the fall as a top dressing for the orchard, it will not have the same effect, and I am one of the strongest advocates of that method of manuring an orchard. In those exposed locations where the circulation of air is cut off, I think many of us have noticed that in such positions the blight on the spurs of the trees is apt to appear about the time they are in blossom or a little later, and it is very much worse than where there is a free circulation of air. As to the matter of resisting blight among the different varieties, I think there is a great difference, and I do not think we have considered this question as we ought. I have not the slightest doubt that if every tree of the Transcendent was destroyed, it would be a blessing, and the same thing would be true of the Yellow Transparent. There are other cases, like this of the Northwestern Greening, an apple I introduced, and the Arctic, where you scarcely find any blight.

Mr. Beckley: I think it would be a very good thing to eradicate all those blighting Transcendents, but what would you do with us?

I have some trees that are thirty-five years old, and they are still bearing well.

Prof. Green: There has been some question about the Northwestern Greening never blighting. Four years ago Mr. Spring sent me specimens of four trees. I planted them in our orchard, and some of them blighted quite a little. They not only blighted, but they were too tender for us.

WHAT KINDS OF POTATOES HAVE PROVED THE MOST VALUABLE?

J. C. WALKER, ROSE CREEK.

I shall endeavor to answer this question put to me by our worthy secretary. I have grown the Snowflake, Burbank, White Elephant Empire State, New York Rural and Mayflower, for late varieties, and for early, the Early Rose, Early Sunrise and the Beauty of Hebron. The last named variety is the most valuable for early, never yielding less than 300 bushels to the acre, and even more, of the very best table potatoes. I have grown the New York Rural side by side with the Mayflower for several years, and the Mayflower has proved the most valuable potato, having produced from 300 to 400 bushels per acre of marketible potatoes, and also many of second size that will do well for seed the next season.

I have discarded all varieties except the Mayflower and Beauty of Hebron. The last two named have proved the most valuable. I plant the Mayflower three and one-half feet apart each way, and the Beauty of Hebron three feet apart in drills. Each kind completely covers the ground with vines.

Mr. Taylor: On what kind of soil do you grow your potatoes?

Mr. Walker: On sandy loam with streaks of black loam. I generally get the best yield on the darker soil.

Mr. Bunnell: I would like to know how he cuts his potatoes.

Mr. Walker: More than forty years ago when I lived in Wisconsin, when we paid $1.50 a bushel for seed, and it was quite profitable to raise seed, I recollect reading that small tubers would produce good seed, and I proved that to be correct. I adopted a plan, probably fifteen years ago, of cutting the seed end of small potatoes, and I have never failed to get a profitable yield. There is only one thing that we have to guard against in growing potatoes. Small ones have as many eyes as large ones, and some people have an idea that because the potatoes are small they must put in much seed, but we should put in only three eyes to the hill. It has been said that small potatoes do not produce large ones. Potatoes are different from almost anything else, because our finest tubers are grown from seed in the first place. The only thing to guard

against is not to get too much seed in the ground. The same rule holds good with potatoes as it does with corn. If you plant too many kernels in a hill you will get small ears; and it is the same way with potatoes, if you put in too much seed the potatoes will be small.

Mr. Bunnell: Is the Beauty of Hebron as early as any?

Mr. Walker: Yes, it is as early as any potato. The Early Ohio grows hollow like the old Peachblow. A large mealy potato will grow hollow, but the Hebron never gets hollow. So far as mealiness is concerned, I have never discovered any difference.

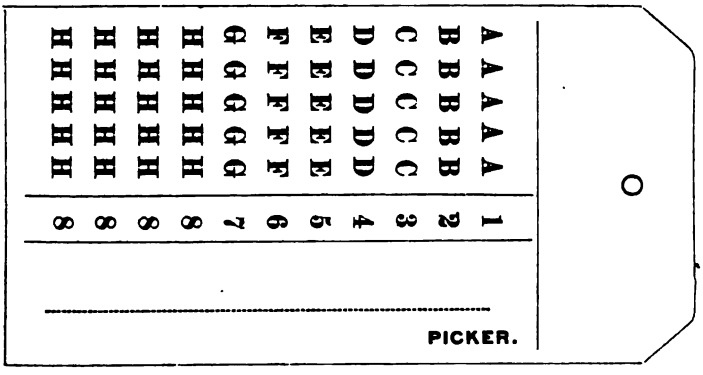
A METHOD OF KEEPING ACCOUNTS WITH BERRY PICKERS.

A. G. LONG, EXCELSIOR.

There are various methods of keeping accounts with pickers, but most of them are very crude and unsatisfactory, both to the grower and to the picker, and a system in which the responsibility is equally divided between the employer and the employe, and in which there can be no question as to the correctness of the account, is the one which would seem the most desirable to employ.

While in the fruit growing business I made use of a method described below, and, while employing from twenty-five to thirty pickers daily during the berry season, there was not a single complaint made as to the reliability of the account.

A common shipping tag is used, the printing of which costs about $1.50 per thousand. The letters from "A" to "H" are employed to designate the numerals from 1 to 8. The line of figures down the center of the card is an index or key to the letters, and should never be punched.



A cheap ticket punch, costing 50 cents, is used, and every time a picker brings a carrier of fruit to the packing house the number of boxes he has picked is punched out of the ticket (which is tied to a

button or buttonhole, or suspended about the neck of the picker), by the person who attends to the filling of the crates.

The picker is supplied with an eight box carrier, made to hold four in each tier, and when the upper tier is filled it is lifted out and set in the bottom and the four empty boxes put on top. (This has reference now to the picking of raspberries.) By this means a minimum amount of sunlight is permitted to get at the fruit, and it will reach the market in much better condition. Rapid pickers are supplied with two carriers, and when one is filled they are required to place it in the shade and cover it lightly with leaves until the second one is filled. When the carriers are filled and brought to the packing house, the one in charge personally takes each box out of the carrier and places it in the crate, thus being enabled to note the appearance of each box, and if all right the picker is given credit on his card by punching the letter or letters indicating the number of boxes delivered. Thus if an eight box carrier is brought in an "H" is punched out of the ticket, if only three boxes a "C" is punched, if a twelve box carrier is used an "H" and "D" are punched. If the boxes are not up to the requirement, dirty or containing green or overripe fruit, the picker may be docked a box or more, in the judgment of the overseer, or if the boxes are not properly filled, one of them is used to fill the balance, and the picker is given credit on his card for the full boxes only. It is a very reprehensible practice to permit pickers to carry crates to the field with them and fill them in their own way, as it many times affects the receipts to the amount of several dollars a day.

On Friday evening of each week the tickets are collected, the amount due the picker is written on the back of his ticket, the money, together with the ticket, is placed in a cash envelope with the name of the picker written thereon, the envelope is sealed, and on Saturday evening they are paid off, which occupies but a few minutes, and there is no hurried computing or wrangling in the presence of the picker. On Saturday morning of each week new tickets are issued to the pickers, and they are held responsible for the loss or mutilation of their tickets.

At the beginning of the season a rule is established that a picker is to remain during the picking season, and unless he can give a very satisfactory reason, he forfeits his pay earned between the last pay day and the time he leaves. This is a necessary protection for the grower, as he cannot afford to spend his time running after pickers after having once engaged a sufficient number, and this precaution is doubly necessary at Lake Minnetonka, where picnics and excursions are of almost daily occurance, and the temptation to "skip" is very great.

This system may not be new to many growers, but I can assure those who have never tested it that it gives eminent satisfaction and avoids all unpleasant friction between employer and employe.

Mr. Hartwell, (Ill.): I use this same method somewhat modified. I have a contract with my pickers at one and one-half cents per quart for the season for strawberries, with the un-

derstanding that they will be paid one cent per quart each week, and if they remain during the entire picking season they are paid the other half cent at the close, but if they do not remain they are only paid at the one cent rate. I want to refer to a method that a friend of mine uses. He has at the head of his tickets, 1 cent, 1½ cents, 2 cents, 2½ cents and 3 cents printed. He hands out a ticket to the picker, and, say, on the first day's picking he punches out a two cent mark for everything that is picked. The next day the picking may be a little better and he will punch out 1½ cents, and when the picking is at its best and a picker can easily earn $2.00 a day, he will punch out the 1 cent mark. At the close the picking is probably very poor and the picker feels rather discouraged and then he punches out the three cents. I have a curiosity to know whether that would work or not.

The President: He might make a mistake and punch out the wrong number. We use the ticket system. The picker picks six quarts and we give him a ticket for six quarts.

Mr. Hartwell: That is too much work altogether. It is a tremendous job to count up the tickets for 125 pickers. I couldn't use that method at all.

The President: The counting is all done afterwards.

Mr. Hartwell: Yes, but it would take the time of one man an entire day to count up such a large number of tickets. With the ticket described by Mr. Long all you have to do is to just look at your one ticket for each picker and add together the numbers punched out; you have it all in a nutshell.

The President: In the method we use the pickers keep their tickets, and when they are paid off they bring them in in envelopes, the number of quarts they have picked are counted, and they do their share of the bookkeeping. They find they have picked a certain number of quarts of strawberries, the collector takes the tickets and runs them over and finds the number of quarts each picker has picked and pays him the money. The picker all the time has got something to show for what he has done when you hand that ticket out to him.

Mr. A. G. Long: The picker has the ticket I described attached to his person, and when he brings in a carrier with berries you can depend on it that he is going to be sure he is given the proper credit for the number of boxes picked, and he will also know to a cent at the close of the week just how much money is due him, and when he opens his envelope, counts the

money and finds it corresponds with his own computation, the account is closed. He has only one ticket to take care of, while by the method of giving out tickets he must necessarily have a great number, and the liability of loss is just that much greater.

THE PLACE OF EVERGREENS AND DECIDUOUS TREES IN THE SHELTER BELT.

C. L. SMITH, MINNEAPOLIS.

That both evergreens and deciduous trees should find a place in the ideal shelter belt is a statement that I presume will be accepted without argument. The place each should occupy is an open question, upon which there may reasonably be a difference of opinion. I have planted a good many windbreaks myself; I have drawn plans and made suggestions for many more than I have planted; I have also carefully observed the arrangement as well as the want of arrangement on hundreds of farms in Minnesota, Iowa and both the Dakotas. From experience and observation, I am firmly convinced that the most practical and satisfactory arrangement is a double row of deciduous trees around the outside, the trees in these rows to be closely planted; then an open space of fifty to one hundred feet; inside of this alternate rows of deciduous and evergreen trees should be planted four to eight feet apart, to be thinned out in after years as fast as they begin to crowd. The first rows inside the open space should be evergreens, and the row or, better still, the two inside rows nearest the garden and buildings should be evergreens. The trees will do better if mixed in this way; the appearance is better, and a better protection is provided against wind and snow.

To secure this kind of a shelter belt with the least expense and the greatest certainty, plant first the deciduous trees in the belt where they are to remain, and at the same time plant in the garden a nursery of small evergreens to be transplanted after two years. My reason for this is, that the evergreen requires a certain amount of shade and protection, that can be given in the garden to a better advantage than if they were scattered in the belt. After two years the deciduous trees will have grown enough to give some protection from the dry, hot winds of summer, which are most injurious to the evergreens. One other important advantage: the evergreens after two years growth in the garden nursery can be safely moved to their places in the belt without danger of loss. I moved eight hundred two years ago, losing less than five per cent. They were arbor vitae seedling, from the woods of northern Minnesota. They had been two years in the nursery, and they made a growth of ten to fifteen inches the year they were transplanted. I forgot that Brother Richardson was to tell us about varieties; I must not trespass on his subject; but whatever variety is used I would handle in the same way. I have two hobbies on this subject, close planting and evergreens native of Minnesota.

All farm buildings and gardens in the northwest ought to be pro-

tected with a good shelter belt of evergreens and deciduous trees. It costs no more to arrange them properly than to plant otherwise. The measure of satisfaction and benefit derived will depend largely on the arrangement. The value of a good shelter belt is always many times greater than its cost.

Mr. O. C. Gregg: I would not like to let that paper pass without a word or two of comment. I listened carefully to what was read, and I am in happy accord with every statement made. One point he made emphatic is the tree culture in the western portion of the state. I think the trees upon the prairie that will be successful are the willows, and it looks now as if the most successful of all would be the Russian willow. The golden willow will make a great record, I think. I would like to have the nurserymen speak of that matter and see how our success corresponds. The laurel-leafed willow with me is a good one, and after four years experience with it I find it is a beauty. When people come to my place—and we are often called on to meet them—they are always filled full of enthusiasm when I take them down and show them the laurel-leaved willows, but when fall comes I am taken with the golden willow. I do not think it is safe to say that those willows are not infested with insects, but so far we have had little trouble with the bark louse and the saw fly. The statement Mr. Smith makes just hits the whole history of evergreen planting on our prairies. I was much pleased with the report Prof. Green made in reference to growing deciduous trees and evergreens. I find we can grow the other kind just as nicely as can be if we only protect them with these willows against the hot winds.

Mr. G. F. Strand: I would like to ask Mr. Smith how large he prefers seedlings.

Mr. C. L. Smith: I have not handled anything for twelve years except from the forest. I usually help to gather them myself, and never take anything longer than eight inches and from that down to three and four inches. I think the six inch seedling is about the most preferable size I have handled. Those I spoke of were about two years old when I took them up, and I saved over ninety per cent of them in the nursery bed in the woods. The whole secret of success is to keep the sun and wind off from them all the time. Five minutes exposure in May will sometimes kill a bunch of a hundred.

Mr. Gregg: We have used Prof. Green's underbrush shelter for those evergreens. I followed out his instructions as to planting, but they were carefully protected from south winds

by heavy willow belts, and we did not lose five per cent. They need protection from those sweeping south winds.

Mr. C. L. Smith: After they are planted out I protect with lath screen. When I come to set them out I want something to break that May and June wind. If I could not get anything else I would use dirt.

The President: I would like to ask Mr. Wedge whether he considers it necessary in the southern and eastern part of the state to have a shelter belt of deciduous trees in order to start an evergreen shelter belt.

Mr. Wedge: In our section I was under the impression, until we had that very dry period four or five years ago, that there was no special necessity for deciduous trees for shelter to the evergreen, but that very hardy tree, the Scotch pine, was considerably damaged at my place (on the outside row), and I found that only those evergreens that were exposed were injured more or less, while those that had a very slight shelter were in very nice shape. I had a double row of Scotch pine that were entirely protected, and they did not show a twig that was injured. I think the wind was too severe; it was in the latter part of winter and the early portion of spring, and the evergreen windbreak that was exposed to the wind looked badly and has looked badly ever since.

As we go east from Albert Lea there is a very interesting and decided change in the appearance of evergreens, which I I cannot explain. During the summer myself and family made a camping trip to the Mississippi, and I had plenty of time to observe the varying features. Going east from Albert Lea and Austin, I found the evergreens doing better. At Albert Lea white pine is worthless, and west of Albert Lea the white pine is a failure. At Austin the white pine is a beautiful and glorious tree. I do not remember whether it is out in the open, but it is a fine tree, the finest, without doubt. The balsam fir is also a fine tree. I think in speaking of the different varieties of evergreens we will have to vary our rule a great deal in order to accommodate the different localities of the state. It is certain that in that respect the northern part of our state is entirely different from the southern.

Mr. Gardner, (Iowa): I would like to make this remark, that after forty years or more of experience in planting forest trees, if I were going on a farm now anywhere on this open prairie, I would not do it myself, neither would I advise any one else to plant the willow. There are so many other deciduous

trees that are native to your state and mine that are valuable while growing, and very valuable when grown, and beat the willow altogether. I know a grove that was planted twenty to thirty years ago with different kinds of native deciduous trees and quite a sprinkling of evergreens. You go to those groves today and examine the different varieties, and if you could have the same trees on your farm today see how many of you would select the willows. I do not believe one of you would.

Mr. Wedge: What would you plant, Mr. Gardner?

Mr. Gardner: I would not plant the willow or the cottonwood. There is not time to go into the minutiae of growing these different varieties of forest trees, but they are just as easily grown, and you can get just as good size as you can get with willows if you know how. Take the oaks and that class of trees, the black walnut and the butternut, they can all be easily grown.

Mr. Dewain Cook: I live about one hundred miles west of Albert Lea, and I think it is absolutely necessary to have a shelter for evergreens. The white pine is worthless. The best tree to start for a shelter for evergreens, for the reason that it is a rapid growing tree and breaks the wind, is the willow.

Mr. C. L. Smith: In my paper I said I gave suggestions for planting trees which had reference only to those which I planted myself. To a certain extent I could endorse what Mr. Gardner says. He puts in the proviso "if they know how." The difficulty is they do not know how, and they have not got time to learn. If they do not have time and do not know how, the safest thing to plant is the willow. My experience from an observation of thirty-three years is that the farmer who wants to start a grove of evergreens should plant two rows of willows for a shelter.

Mr. Richardson: If you will come down our way and see what they have done with the willows the last ten years, it will take all that nonsence out of you. (Laughter).

Mr. C. L. Smith: Yes, after they had the willows twenty years it was more profitable to plant the other trees. If Bro. Richardson had been there when I was there, he would have tied to the willow.

Mr. Clark: I will endorse what Mr. Smith says in his last remark. I think it usually depends a great deal upon the location. You take the eastern half of Minnesota, and the climate is such that it is all right to begin to plant other trees besides

the white willow, but when you come to the western part of Minnesota, the white willow is the main thing to plant, and when you come to Dakota, you are not going to plant anything else except the white willow. The climate has everything to do with it, and the further west you go, the more unfavorable you find the climate, until you get to the mountains.

The President: I think that is a point you want to keep in mind. What Mr. Smith, Mr. Gregg and Mr. Clark are talking for is the western part of the state and the Dakotas. It is entirely different in Minnesota in the eastern and southeastern part of the state; you do not need any shelter, and you can make a perfect success without anything of that kind. So keep that point in mind, and do not say that the willow is the only thing, or anything else. Do not say that willows should not be planted anywhere, because at some places it is absolutely necessary.

CURRANTS FOR THE MARKET GARDENER.

WM. LYONS, MINNEAPOLIS.

Mr, President, I did not prepare any paper on this subject. I can say all I have to say in a few words. My experience in the currant business in Minneapolis was that the Red Dutch was first, the Stewart Seedling came a little later, and if I was planting more I would plant more of the Red Duch. There is another currant I raised a good deal of, and that is the Prince Albert. That and the Long Bunch Holland were a good deal alike, and both of them will keep extremely late. In old times the earliest fruit brought the best price on the market, but now the late fruit brings the best price.

Mr. C. F. Gardner: Have you ever tried the Pomona?

Mr. Lyons: No.

Mr. C. L. Smith: From which of the currants you have grown for market did you get the most money?

Mr. Lyons: The last three years I have not marketed any; I have rented my place. I used to make the most out of the Red Duch. There are some other varieties now in which there is probably more money.

Mr. Philips, (Wis.): Why is it that the later fruits bring the most money?

Mr. Lyons: It is because they come in after the rush is over from the other states.

Mr. C. L. Smith: Would you grow white currants for market?

Mr. Lyons: There is not much market for white currants.

Mr. C. L. Smith: Does size and color count as much as quality?

Mr. Lyons: Size counts a good deal.

Mr. Pond: With me the Stewart Seedling is a very unprofitable currant. As soon as the currant begins to ripen, it begins to drop off, and by the time you are ready to gather the crop one-third has dropped off the bunch, and since a later currant is the more profitable you are losing considerable in that way. The Stewart Seedling has to be picked so early you do not get a good price for it, or else they have dropped off so much that you have very ragged bunches, and they will not sell well for the rest of the season.

Mrs. Crooker: I would like to speak a word for the Stewart Seedling. I would not like to have the report go out that the Stewart Seedling is an unprofitable variety. With us it is the very latest, and they sold for $3.00 per bushel.

Mr. Wheaton: The berries on the end of the stem drop off, and they do not carry a full bunch.

Mr. Philips, (Wis.): A commission man in Chicago told me, "You fellows in your horticultural societies will have to grow some late fruit, for the women will not stand over the stove in hot weather to make preserves."

Mr. Taylor: After raising currants in Minnesota for twenty-five years, I have not found anything better than the Red Dutch. For home and table use I use the White grape, and for jelly we use the Red Dutch, and for late use we use the Long Bunch Holland. We had the last in September; they remained on the bunches very late. I would advise farmers to plant Red Dutch.

Mr. Hawkins: There is such a wide difference in those reports. Has not fertilization and cultivation a good deal to do with it?

Mr. Harris: The soil has a good deal to do with it.

Mr. Beardsley: I have one reason to advance in answer to the question why it is they want a late currant. In fact, there are two reasons, one is that, as a rule, people do not buy their currants while the market is going down, thinking they will get a little cheaper, but just as soon as they begin to advance they will begin to buy, and when currants go up fifty cents to a dollar a crate then is the time to sell them.

Mr. Yahnke: I believe there are more dollars and cents in the Red Dutch than in any other, but it is just as the last speaker says, nobody wants to buy an article when the price is

going down, but raise the price five cents and the market will be rushed. Therefore, just as soon as the commercial grower sees that the market is filled up, he should hold his currants; he should wait until the market gets empty and then rush them in as fast as possible, and he will sell them at a profitable price.

Mr. Dewain Cook: I want to say a few words about the Long Bunch Holland: I have grown currants for market and found the Red Dutch the most profitable; I find the late currants sell better than the early ones. This year the Long Bunch Holland was the best currant I had. I shall drop the Red Dutch. The Long Bunch Holland did not last much longer than the Red Dutch; when the Red Dutch was gone, the Long Bunch Holland was gone. As a late currant I do not think it held on much longer than the Red Dutch.

Mr. Richardson: I think we had Long bunch Holland four weeks after the Red Dutch were gone. I have bushes there that stand as high as my head.

Mr. Charles Patten, (Iowa:) I wish to submit the statement that the difference in the soil accounts for the difference in the same variety of currants. This gentleman (Mr. Barnes) has a very deep, rich, moist soil, while Mr. Cook has a drier soil, and the atmosphere is also drier than where this gentleman lives, and if one will observe he will notice the fact that almost any variety of currants will do better on clay soil, and almost any clay soil, if properly enriched, will do better than ordinary soil. The old Cherry currant is an example of this, and also the White Grape. The White Grape is worth double, grown on clay soil than it is on prairie soil. The gentleman spoke of the Prince Albert. If grown on a clay soil it will be a success, but if grown on prairie soil it will not be worth much; so, as I said before, the soil will explain the difference.

Mr. Barnes: I would like to ask Mr. Patten whether he would grow Long Bunch Holland or Prince Albert?

Mr. Patten: On clay soil I would plant the Prince Albert, because it is a nicer currant.

FERTILIZING BARREN PLUM TREES.—An uncle of mine had a clump of plum trees which were, to all appearances, healthy, mature trees. They blossomed freely each spring, but never had fruit, until upon investigation it was found that the blossoms lacked fertilizing pollen. As an experiment a wild plum tree that was just in blossom was cut and brought to the orchard, where it was set up in a barrel of water in the midst of the heretofore barren trees. The experiment resulted in an abundance of fruit. The wild tree furnished the fertilizing pollen which the other trees did not supply.

NOTICE OF

Summer Meeting,

1899,

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY.

The regular summer gathering of the society will be held as usual this year at the State Experiment Station, at St. Anthony Park, on Thursday, the 22d day of June. It is the purpose to set this date to accommodate the rose and strawberry growers in that part of the state most accessible to the place of meeting, and a liberal premium list has been prepared, which should draw out a very full exhibit.

The general order of exercises for the day will not differ materially from that of similar occasions in previous years. The forenoon will give ample opportunity to those so inclined to look over the experiment gardens and orchards and observe the changes and progress in this interesting and valuable work.

Prof. S. B. Green, in charge of the horticultural work at the station, and his assistants, will be in readiness at ten o'clock, and thereafter during the forenoon, to conduct parties over the grounds and supply any information as to the work of the station desired. If you are interested in the development of local horticulture, you should, by all means, take advantage of this opportunity to secure information under such favorable conditions, where the object being talked about is also displayed before you.

At 12:30 o'clock lunch will be spread in Armory Hall, and all are invited to contribute towards this festive occasion. The annual reunions, where we break bread together, go far to cement the tie which holds in fraternal sympathy those who are laboring together for the advancement of our beloved art of horticulture. Every one is welcome. If not a member, $1 00 will make you such and give you all the publications of the society and a voice in its deliberations—but come anyway!

After lunch the regular summer session of the society will be held. The informal program will include "lessons to be drawn from the late severe winter," in five minute papers, by a number of the members, and opportunity for discussion as usual.

An election will be held for the purpose of selecting some one to be recommended to the governor of the state for appointment, to

represent this society, as a member of the board to be created under the forest reserve law, passed at the last session of the legislature. This law was published in the May Horticulturist.

MEETING OF THE WOMEN'S AUXILIARY.—The regular summer meeting of this auxiliary society will be held at some convenient time during the day, to be announced.

HOW TO REACH THE GROUNDS.

Take the Como-Interurban electric car in either St. Paul or Minneapolis and get off at Dooley avenue, where carriages will be found in waiting to carry visitors to the grounds, one-half mile distant, from 9:30 a. m. to 1:30 p. m. Those who drive over in their own conveyances will find ample accommodations on the grounds for stabling.

Visitors should NOT take the Interurban car, but TAKE the Como-Interurban-Harriet car.

For further information address

W. W. PENDERGAST, President, Hutchinson.

A. W. LATHAM, Secretary, 207 Kasota block, Minneapolis.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place by 12 M., to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The fruit and flowers exhibited must have been grown in Minnesota and must be correctly labelled.

No premiums will be awarded on unworthy articles.

FLOWERS.

(Six flowers of each variety.)

	1st prem.	2d prem.	3d prem.
Collection of cut roses (outdoor grown)	$3.00	$2.00	$1.00
Each named variety of cut roses (outdoor grown).	.50	.25	....
Bouquet of mixed flowers	1.50	1.00	.50

FRUIT.

(One quart of each variety.)

	1st prem.	2d prem.	3d prem
Collection of strawberries	$4.00	$3.00	$2.00
Each named and catalogued variety of strawberries	.75	.50	.25
Seedling strawberry never having received a premium from this society	3.00	2.00	....
Each named and catalogued variety of currants	.75	.50	.25
Each named and catalogued variety of gooseberries	.75	.50	.25

VEGETABLES.

Collection of early vegetables	$3 00	$2.00	$1.00

Calendar for June.

O. M. LORD, MINNESOTA CITY.

Our hired man said this morning: "I had supposed there was no work connected with berry growing, and here we have been busy since the ground thawed out, and no let up to the work. I thought all there was to do was to stick in the plants and pick the berries, eat all you can and sell the remainder. Now June is here, and look at the coming work!" The newly set strawberry plants must be immediately cultivated, and if blossoms appear they must be pinched off. The winds have been so high that the mulching on the old bed needs adjusting between the rows. To avoid late frosts the mulching was left undisturbed, until the plants needed air and sunlight. All the dead canes of blackberries and raspberries are to be cut out and the laterals cut back a few inches, and they all need cultivating between the rows. Some of the young fruit trees do not stand upright. Now is the time to straighten them, and a few unnecessary limbs should be taken off.

There is now a prospect of large fruitage with strawberries, currants, goosberries, wild plums and crab apples. It is hoped the past winter has killed many insect pests. The curculio begins its work soon after the plums are set, and spraying for them is not as satisfactory as jarring the trees. A few hours work among the grape vines is absolutely necessary, if we expect any returns from them.

April and May were much dryer months than usual in Minnesota, but the ground has retained sufficient moisture to give everything a good start, especially weeds. Where we cannot reach all the garden stuff and young trees with a cultivator in time to destroy the small weeds, a garden rake drawn along closely to them stirs the ground and advances the plants in growth, and kills most of the weeds so as to show distinctly where the rows are when we come to cultivate and saves a good deal of labor in after cultivation. Where the weeds or grass have attained such a growth that this is not practicable, a scuffle hoe with a blade an inch and one-half wide and from eight inches to one foot in length, preferably made from an old cross cut saw blade, is one of the best tools for fast and easy work. This is also a valuable tool among the strawberry plants in cutting out weeds or grass between the hills where you do not desire to disturb the soil. It simply shaves off weeds and grass at the crowns, leaving the dirt as a blanket on the soil, which conserves the moisture while killing the weeds. It is doubtful if weeds rob the

soil of its natural fertility, but they do effectually rob the plants we would cultivate of their food and unfit the soil for their profitable growth.

Summer fallowing is still a popular method of fitting the ground for special crops, but it adds nothing to the natural fertility, and is not so valuable a process for preserving the productive capacity of the soil as keeping it covered with vegetable growth, even weeds if properly handled.

Our present methods of manuring have a tendency to perpetuate the weeds as a nuisance, but if weeds are persistently kept from going to seed in the gardens and among the trees and vines, though they make much work they are much more easily controlled.

The productive capacity of our soil is largely governed by its supply of moisture. If this is just right in quantity at the proper time, our crops are abundant. *Cultivation* has more influence in this direction than is generally well understood. It is not sufficient just to kill grass or weeds, but evaporation must be prevented, or the ground loses its moisture and our plants suffer. Shallow cultivation under these conditions is the best remedy.

The prices of berries last year and the disastrous winter have discouraged many small fruit growers in this vicinity. Our faith is shown by our works. Though we have ploughed up several acres, we have newly set more than have been ploughed up, considering that the lesson of last winter is worth more than its cost in teaching us what varieties to plant and what is necessary in protection to insure us against loss. These conditions have occurred about every ten years since we began fruit growing, and the one who starts first and persists is the one who will not complain of failure.

Strawberries in Winona were selling last week at 5 cents per quart—southern berries, of course, but the appetite will only be sharpened by the time ours appear. If they must be shipped, there is no money in them for the grower at this price, but a home demand saves expense and makes much difference in the returns. If low prices are to continue, the cost of producing and marketing must be reduced, and the best method to do this is to compare notes and give the subject more careful attention.

THE SUCCESSFUL HANDLERS OF CAULIFLOWERS—Use houses or cellars, usually built into a sidehill, stoned, bricked or planked up on back or sides. They are then carefully boarded all over, covered with one or more thicknesses of tarred paper and finally shingled. The south side usually has several windows for light when needed. Mats are prepared to cover them. A small stove or several of them keep the temperature above freezing. Cauliflowers are dug with about six inches of dirt on roots and are packed right side up as close as possible on the floor. Shelves are often put in and packed in like manner.

Secretary's Corner.

WHY WE ARE LATE.—This number has been held to fix the date of the summer meeting. The July number is liable to be a little late also, on account of the time of that meeting.

THIS SOCIETY AND THE FOREST RESERVE BOARD.—The horticultural society is one of the associations which is entitled to a representative on the board to be created under this new law, and some one will be selected for this purpose at the summer meeting of the society. There is work cut out for this board which will call for much self sacrifice on the part of its members, who work without compensation. Prof. S. B. Green is a member ex-officio.

HAVE YOU RECEIVED THE REPORT FOR 1898?—After a long delay on the part of the printers, most of which was entirely excusable, the secretary was able, the last week in May, to send out the balance of the 1898 reports due our members. If any have not yet received a copy they are requested to notify the secretary or if living in or near Minneapolis to call at the office in person for them, as reports are not mailed to those living in the city or adjoining suburban towns.

THE HILL ORCHARD BEST.—"One thing that I am impressed with most is that trees wintered better upon this side hill orchard than than they did in the valley. Our valley orchards are full of blossoms, and most of the trees seem to have escaped without injury, but a good many of them show the effects of the winter. I do not think there has been any root killing on our place. I attribute this to the splendid rains we had in the fall that filled the ground up with moisture."—J. M. Underwood, Lake City, May 19, '99.

HAVE YOU GIVEN AWAY YOUR 1898 MAGAZINES?—The cloth bound reports are sent to our members *with the understanding* that they shall give away the magazines for that year, as they now have them in book form. This will give an opportunity to do missionary work for the society. Distribute them among those who are or should be interested in our work and accompany the gift with personal solicitations to unite with us. The inside page of the magazine cover contains information of special interest to new members. Read it.

THE NATIVE FRUITS OF ALASKA.—"We really do get quite a variety of native fruits. Huckleberries, salmon berries, blueberries and cranberries grow around Dawson—in fact, my brother has them on his claim there. In the Atlan gold fields, about eighty miles from here, where two other brothers are interested, they have wild currants and goosberries as well as the above. If I spend the summer here, as now seems likely, I will try and take personal observations of the fruits and write you. We have established a small vegetable garden on our lot, and I will be able to tell you something of our success with it later."—A. H. Brackett, Skaguay, Alaska, May 7, '99.

SPECIAL MEETING, MINNESOTA STATE FORESTRY ASSOCIATION.—This association, though deprived by the last legislature of its an-

nual appropriation for the benefit of the Forest Reserve Board, which received it, is not yet by any means defunct, and will continue to be heard from during the interval prior to the next meeting of the legislature. At a special meeting held in Minneapolis May 18th, Capt. J. N. Cross, president of the association, was selected by the society to be recommended to the governor as an appointee to represent the society on the board about to be created under the new forest reserve law. This action was taken unanimously by the society, which is a well deserved compliment to Mr. Cross as the originator and zealous advocate of the bill.

A BUCKTHORN HEDGE.—This hedge, as it appears in the frontispiece, is a notable instance of the value of the buckthorn for this use in the northwest. The photograph from which the plate was made was taken about May 18th, and some time before the hedge was in full leaf, as is readily apparent from its appearance as well as that of the neighboring trees. Mr. W. W. Pendergast, on whose place the hedge is growing, and who planted it himself, says of it:

"The buckthorn hedge on the north and west side of my garden was grown from a pound of seed bought of Jas. J. H. Gregory, of Marblehead, Mass., thirty-two years ago. It was planted in a box in March, covered with earth till the seed sprouted and then sown in nursery rows, where it remained two years, when the plants were about fifteen inches high. They were then taken up and placed where they were to remain.

"The hedge is twenty-seven rods long and the plants one foot apart. It is not affected by the coldest winters or the hottest and driest summers."

The acquaintances of Mr. Pendergast will recognize him in the picture as standing in the center behind the hedge.

TIN CANS IN EARLY GARDENING.—Early gardening by means of starting plants in a hotbed and transplanting is not always attended with the greatest success on account of the growth of the plants being checked when replanted. This is caused by disturbing the roots and change of soil. This difficulty can be eliminated by the following plan. Melt the top and bottom from old tin cans. Also remove the solder from the seam, tying a cord or wire about it to keep in shape. Fill with rich soil and plant seeds which have been soaked in warm water for a day or so to insure rapid germination, and place in a warm, sunny place or hotbed.

There will be ample depth of soil for the plant to make a good growth before re-setting. As soon as it is warm enough the plant can be set out in the garden. To do this make a hole in the bed large enough to set the can in. Remove the cord or wire holding the can together, spread it open and let the contents slip out into the hole. Pack the earth closely about this and your plant is replanted without changing the soil or injuring the roots in any way. The cans can be laid away for use next spring. Plants started in this way will have two or three weeks the start of others.

SOME OF THE STRAWBERRIES SHOWN AT THE SUMMER MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, HELD JUNE 22, 1899.

THE MINNESOTA

HORTICULTURIST.

VOL. 27. JULY, 1899. No. 7.

Summer Meeting.

OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, 1899.

MISS EMMA V. WHITE, MINNEAPOLIS.

(Not a Stenographic Report.)

The summer meeting of the society, held June 22d, at the State Experiment Station, St. Anthony Park, was no exception to those of late years in the matters of attendance, interest and exhibit nor in the uniformly delightful weather that so auspiciously favors these gatherings. Some three hundred or more gentlemen and ladies, horticulturists and their friends, and others interested in the society's work, were present. Of course the local attendance from

A GLIMPSE AT THE MUSHROOM EXHIBIT.

the Twin Cities was large, but there was also a goodly number from outside, among whom well known as workers in the society were J. S. Harris, of La Crescent; E. H. S. Dartt, Owatonna; L. R. Moyer, Montevideo; Clarence Wedge, Albert Lea; J. P. Andrews, Faribault; J. M. Underwood, Lake City; O. M. Lord, Minnesota City; D. F. Akin, Farmington; J. P. Davis, Goodhue; H. M. Lyman, Excelsior; J. R. Cummins, Eden Prairie; C. E. Older, Luverne; R. H. L. Jewett, Faribault, and our president W. W. Pendergast, of Hutchinson.

A new feature of the occasion, attracting much attention, was the exhibit of edible mushrooms by the Minneapolis Mycological Society. The members of this society are very enthusiastic in their study and investigation of this interesting subject, and are succeeding well in their laudable efforts to make this palatable and nourishing food better known to the public. There were five different exhibits, showing about forty varieties, that of Dr. Mary Whetstone, containing twenty-one varieties, being the largest.

The usual interest was taken in the progress of the work at the farm, Prof. Green lending his services as a conductor to the various parties which made the examination of the grounds, buildings and practical tests, the chief object of their visit. Strawberries were hardly ripening as yet, but nevertheless the strawberry fields were as much of an attraction as usual this year. The most noticeable feature on the grounds was the preparation making for the new building to be devoted to horticulture and botany. Excavations for the foundation are in progress, and the building is to be completed for use in the fall.

The ladies of the Women's Auxiliary held a short business session, at which preparations were made for the representation of the Auxiliary at the headquarters which the Woman's Federation of Clubs is to have at the state fair this fall.

The exhibit, mainly consisting of strawberries, under the circumstances was an extraordinary one. For necessary reasons the meeting was called a little early for the full ripeness of this crop, and a light show was looked for. Instead, it was the largest ever made, we think, at our summer gathering. At least 150 plates of this luscious fruit were shown, comprising some sixty named varieties. The fruit was well ripened, of most extraordinary size and in prime condition. The frontispiece of this number conveys a little idea of the brilliance, size and beauty of the display. R. H. L. Jewett, whose fruit gardens are located at Faribault, easily carried off the honors for largest number of varieties, but handsome displays were made also by Jewell Nursery Co., Lake City, C. W. Sampson, Eureka, F. F. Farrar, White Bear, A. G. Wilcox, Hugo, S. R. Spates and Thos. Redpath, of Long Lake, and others. A number of plates of green currants and gooseberries were shown. Mr. Bussee, of Minneapolis, contributed a large display of early vegetables, and the Jewell Nursery Co. the usual large exhibit of garden roses, comprising in this case fourteen named varieties, shown in duplicate. These roses came in too late to furnish the regular decoration for our lunch tables, but the wonderful array of peonies furnished by the station made a very satisfactory substitute.

This description would be incomplete without reference to the show of seedling apples kept over in the cellar from the crop of 1898 and exhibited by Mr. D. F. Akin, of Farmington. The writer did not have an opportunity to test them, but their appearance was attractive and gave little or no evidence of deterioration. They furnished proof positive that Minnesota soil and climate can originate and mature a late keeping, hardy winter apple.

The friends gathered at the lunch tables about 12:30, where the invocation was pronounced by the Rev. C. L. Diven, D. D., of Unity

church, St. Paul. The basket lunches were supplemented by appetizing coffee, delicious cream from the farm dairy, lemonade, etc., furnished and served by the school, all of which received ample justice.

President Pendergast called the society together for the program of exercises immediately after the luncheon, opening the same by a pleasant speech. He referred to the fact that they were gathered on the longest day of the year, though fearing it would be all too short for the many things they had to see and hear. He congratulated the members on being in a state where fruits can be raised in abundance and of the best quality, and where there is nothing to fear from the action of cold or frosts, whereas in the south they are all the time in fear that something will destroy the harvest. He was in Florida and saw the great desolation that was produced by the destruction of their one crop a few years ago, and in a journey of 800 miles through the state did not see an orange, and wondered how the people lived. They said they used to pull through on "mullets and grits" (a kind of pounded corn), but now they lived on "sick Yanks." But Minnesota is to be congratulated in that a diversity of fruits can be raised and in a certainty of harvest, which in his forty-three years residence he had never known to fail. Altogether the president took a very optimistic view as to the possibilities of the state in its fruit industry, both as to quality and prices.

Col. W. M. Liggett, Director of the Station, welcomed the society in a few words of cordial greeting, suggesting that in the co-operation of such bodies the success of their institution largely depends and hoping to receive it in the future as in the past. Referring to the appropriation of $34,000 for the horticultural building, Col. Liggett hoped we would be able to hold our meeting in the new building next year.

Mr. J. M. Underwood made the response for the society, speaking of the school, its progress and work, as a special heritage of the horticultural society, and of their pride in the able body of men at its head, rejoicing in the hearty accord between the school and the society.

Mr. Wedge was to have laid the corner stone of the new building, but sufficient progress not having been made, the president said Mr. Wedge could act in a speculative way and lay the corner stone in imagination. He was therefore introduced and delivered the following able address on "The New Horticultural Building and what it Represents." (See index.)

Prof. Green was called upon to respond, and, although disclaiming any thought of making a speech, spoke to the point somewhat as follows:

"This horticultural society has always meant a good deal to me This is the twelfth year since I have been in the state, and I have attended eleven of these meetings, and in all this time I have had the most cordial support of this society. Had it not been for this support I know I should not be here today, and it is through the advice and counsel received from you that I have attained to some measure of success.

At the time of our first summer meeting, which was twelve years ago, we met in the grove and Prof. Porter spoke about the proposed school. Then we had but one pupil. From that time we have had a steady growth, until our school is well known throughout the Union in the educational field. I am proud of the good it has done; proud of its success. It is a success only because it has been helpful. We started with the single aim of being helpful, and we have succeeded in this effort. Such things ought to succeed. There have been very discouraging times, times when persons of influence did not regard us with favor, but our school has kept on growing, and now we get just as good appropriations as any other educational department. In regard to the new building, a large part of it will be for horticulture, though a part will be devoted to botany, and Prof. Lugger and the chemistry department will both find a home in it. Its significance lies in the opportunity to do additional work. I do not know that I have had many days when I feel prouder than I do today. I feel as though things were coming my way, and that I have the opportunity to do something more helpful than in the past. I know that the new building brings new responsibilities, and I sometimes shrink from its establishment because I know that I must work in new lines and bring about a larger development. But I hope to assist in making this school of agriculture as good as it can be made, and I hope you will all help in this industrial education which is going to do so much to help mankind.

Mr. W. M. Babcock, Minneapolis, was called upon on behalf of the Mycological Society. He said:

"It gives me great pleasure to be permitted to appear before you on behalf of the Minnesota Mycological Society this afternoon, and thank you for the privilege of exhibiting our pets. We have greatly appreciated the interest you have displayed in our exhibit and thank you for it.

"Our society is young yet, having been organized only last fall, and we are all amateurs working at a difficult study. We have been able to identify all of the specimens exhibited by name, and we know those that are labeled edible are so from personal experiment.

"We are unfortunate in having to exhibit a fruit that is so perishable. Most of the specimens shown here were gathered by the members since four o'clock this morning, and only very few will keep over a day or two. We have brought these to show to your neighbors. Doubtless you will recognize many of them as nuisances in your gardens and orchards and have cut them out or passed them by with a hostile kick. Don't do it again when next you see them. Gather them carefully and take them to your breakfast table. They can be stewed, fried, baked or broiled, and when rightly cooked are delicious.

"Right here let me caution you. Examine them carefully for insects, as they are even more fond of them than we are. Cut off the stem close to the gills, and if you notice little fine holes they are infested, and it takes a mushroom crank not to mind inhabitants.

"Another word of caution: Do not rely on any one's telling you to cook a mushroom with a silver spoon, and it is all right if the spoon

does not turn black, or that it is all right if it has pink gills or peels. There is no single test known by which you can tell an edible mushroom. You come to learn to know them as edible just as you know different varieties of strawberries or apples.

"We shall be happy to meet any and all of you at our society and have you become members if so disposed; the cost of membership is only one dollar a year. We meet every Monday evening at the office of Dr. Mary Whetstone, 408 Nicollet avenue, at 8 p. m., for the purpose of studying specimens gathered by members and the comparing of notes. Seeing the mushrooms actually before you is much more valuable than hearing or reading about them."

The president then announced the general topic for the day, which was, "Lessons from the Late Severe Winter." Papers were read by Messrs D. F. Akin and J. S. Harris, which are given in full (See index); talks were given on the subject by Messrs J. M. Underwood, W. W. Pendergast and E. H. S. Dartt, and a running discussion also brought out many points of interest and value.

Mr. Underwood spoke especially of the part that moisture plays in the success of fruit growing. "What we need most to make a success in fruit growing is moisture, and that any failure is due to its lack has been proven by this winter to be not alone a theory. We had plenty of rain in the fall before the snow came to bring plants through the winter without root-killing. The damage that has been done is due to the continued cold weather and frosts which have expelled the moisture from the tree, rupturing the tissues and producing another form of drouth. The orchards at Lake City came through in good condition. Good, strong, healthy trees were not injured. Weak or young trees that had not got established, were hurt. Good, strong, healthy Wealthys of four or five year's growth were uninjured. This is a good sign. If old trees stand the winter, we must be assured that our trees will stand by us. Some of the lessons then are: Protect young trees for the first year or two. Cover them up the first year and, perhaps, the second, and then wrap in burlap for a year or two. First conserve the moisture, and then protect to prevent severe and continued freezings from driving it out.

Speaking on this subject, President Pendergast said that to all appearances more than eighty per cent of his trees were as good as ever. "I find some of the Duchess dying at the fork, always a weak point with the Duchess. When we have talked about finding a tree as hardy as the Duchess I have wondered, as I have not found it as hardy as some others, the Wealthy, for instance. In my orchard the Okabena looks all right. Of the Peerless there is one dead and others do not look quite flourishing. The Wealthy, Good Peasant, Borovinka, Early Strawberry, General Shields (this has never blighted for me), Sweet Russet, Virginia crab, Hibernal, Anisim, Zuzoff and Charlemoff have come through the winter all right. Though trees may be injured by the severe winter, there are some things that no amount of heat or cold will harm. They are some of our ornamental shrubs, such as the lilac, buckthorn and paeony. The buffalo berry can't be injured. The dwarf mountain cherry is not quite so hardy. A hard winter following a dry fall will injure the ends of

the limbs, but a large part of the bush remains. If you want to get something that will stand everything, get some of these things."

Mr. Dartt: "On our station are many thousand grafted trees. Many of these that had never come into bearing were killed, but the great bulk of them, picked up from all over the country, escaped. Most of those from three to five years old are all right. The injury was done where the snow had blown off. In one place where the evergreen trees had been trimmed up too much the wind swept under and blew the snow away, and the trees near were root-killed, and in other parts of the orchard where the evergreens had been considerably trimmed the trees were injured. Elsewhere root grafts on low ground were root-killed. A neighbor had a good many thousand root grafts that were root-killed. The lessons to be gathered are, cultivate well to keep all the moisture there is in the land, and mulch well. The snow does not always come nor always stay, so we must mulch for protection. The trying time for young trees is when they come into bearing. A heavy crop is so exhausting that if followed by a severe winter they are apt to be knocked out. My older trees are not bearing much this year, although the younger ones are bearing considerably. Perhaps the heavy crop of last year exhausted the vitality of the older trees last year.

Several questions were asked in connection with the papers and talks on this subject, the following being some of the more important facts elicited:

Seedling trees look vigorous at Farmington but have dropped fruit, which may be due to the prevalent east winds this summer.

An extremely dry fall weakens the vitality of the trees more than anything else. If the trees go into winter with plenty of moisture it was the general sentiment that they would not be affected by the cold.

A good mulch of straw and litter will last through the summer and dry months and put trees into good shape for winter.

(Jewett, of Faribault.) Before going into winter quarters last fall, we gave our trees a good wetting, thoroughly saturating the soil. Even the tenderest varieties went through the winter all right. I have not lost a tree, which fact I ascribe to the wetting given before going into the winter.

Tender varieties should be laid down and covered and hardy varieties should be mulched. If it is not the cold that kills, why can we not raise the same varieties that they do in the south? It is the freezing dry, on the same principle that the old lady's washing will be frozen dry in a short time, that injures the trees.

Prof. Robertson asked why his Wealthies were injured, but not his Duchess, which was contrary to most of the experience given It was suggested that there might have been a difference of the conditions as regards the ground being covered with snow, or that of grafting on different stock, but these explanations did not cover the case.

Mr. Wedge said the past winter showed some curious freaks. The trees were probably root-killed. Along with the low temperature he past winter there was a great deal of moisture in the atmos-

phere, it being well down towards the dew point, which he thought accounted for the comparatively small amount of damage done.

In root-killing, the top lives, but the root is killed by the action of the cold. The tree looks vigorous for a while in the spring, but soon dies from lack of nourishment.

At the close of the above program, the society proceeded to select a candidate to recommend to the governor for appointment as a representative of the society on the Minnesota State Forestry Board.

Mr. Chas. A. Duncan of Duluth, was nominated by Mr. Wyman Elliott in a highly commendatory speech, which Prof. S. B. Green endorsed in seconding the nomination. There was no other nomination, and Mr. Duncan received the unanimous vote of the society.

Five o'clock came all too quickly for the interesting opportunities of the day and found the meeting still loth to close.

Too much cannot be said for the very complete way in which the officers and assistants at the station plan and carry out successfully the arrangements necessary to entertain so large an assemblage. The horticultural society owes them much for the aid they render in making these memorable days so thoroughly enjoyable.

AWARD OF PREMIUMS, SUMMER MEETING, 1899.

STRAWBERRIES.

ARTICLE.	EXHIBITOR.	PREM.	AMT.
Dr. Stamen	Gus. Johnson, Excelsior	First	$ .75
Dayton	" "	Second.	.50
Muskingum	" "	Second.	.50
Gillespie	" "	First	.75
Rio	" "	Third	.25
Brandywine	" "	Second.	.50
Cumberland	" "	First	.75
Beverly	" "	First	.75
Edgar Queen	" "	Third	.25
Bederwood	Thos. Redpath, Long Lake	Second.	.50
Lovett	" "	Third	.25
Warfield	" "	First	.75
Timbrell	" "	First	.75
Splendid	S. R. Spates, Long Lake	Second.	.50
Brandywine	" "	First	.75
Bederwood	" "	First	.75
Wilson	C. W. Sampson, Eureka	First	.75
Glen Mary	" "	Second.	.50
Clyde	" "	First	.75
Gardner	" "	First	.75
Brunette	" "	Second.	.50
Lovett	" "	Second.	.50
Tennessee Prolific	" "	First	.75
Bisel	" "	Third	.25
Lady Thompson	" "	First	.75

ARTICLE.	EXHIBITOR.	PREM.	AMT.
Brandywine	R. H. L. Jewett, Faribault	Third	.25
Aroma	" "	First	.75
Snowball	" "	First	.75
Wm. Belt	" "	First	.75
Sparta	" "	First	.75
Smith's Seedlings	" "	First	.75
Patrick	" "	First	.75
Drought King	" "	First	.75
Muskingum	" "	First	.75
Gem	" "	First	.75
Mary	" "	First	.75
Van Deman	" "	First	.75
Haverland	" "	Second	.50
Edgar Queen	" "	First	.75
Pet	" "	First	.75
Epping	" "	First	.75
Mele	" "	First	.75
Enhance	" "	Third	.25
Fountain	" "	First	.75
Rio	" "	First	.75
Acme	J. G. Bass, Hamline	First	.75
Mary	R. H. L. Jewett, Faribault	Second	.50
Brunette	" "	First	.75
Splendid	" "	First	.75
Woolverton	" "	First	.75
Staples	" "	First	.75
Eleanor	" "	First	.75
Arnout	" "	First	.75
Glen Mary	" "	First	.75
Kyle	" "	First	.75
Clyde	" "	Second	.50
Bisel	" "	Second	.50
Gertrude	" "	First	.75
Nick Ohmer	A. G. Wilcox, Hugo	First	.75
Greenville	" "	First	.75
Princess	" "	First	.75
Cyclone	" "	Third	.25
Rio	" "	Second	.50
Bisel	" "	First	.75
Lovett	" "	First	.75
Haverland	" "	Third	.25
Dayton	" "	First	.75
Warfield	" "	Second	.50
Haverland	F. F. Farrar, White Bear	First	.75
Barton's Eclipse	" "	First	.75
Edgar Queen	" "	Second	.50
Crescent	W. H. Brimhall	First	.75
Cyclone	"	Second	.50
Enhance	"	First	.75
Splendid	"	Third	.25

ARTICLE.	EXHIBITOR.	PREM.	AMT.
Collection	C. W. Sampson	Second.	3.00
Mt. Vernon	W. L. Parker, Farmington	First...	.75
Warfield	" "	Third...	.25
Bederwood.,	" "	Third...	.25
Bubach	C. W. Sampson	First...	.75
Capt. Jack	"	First...	.75
Enhance	B. T. Hoyt, Hamline	Second.	.50
Cyclone	" "	First..	.75
Homestead	R. H. L. Jewett	First...	.75
Collection	Jewell Nursery Co., Lake City	First...	4.00
Enormous	" " " "	First...	.75
Sharpless	" " " "	First...	.75
Jessie	" " " "	First..	.75
Bubach	" " " "	Second.	.50
Capt. Jack	" " " "	Second.	.50

J. S. HARRIS, Judge.

CURRANTS.

Fay	Gus Johnson	First...	$ .75
Victoria	"	Second.	.50
Victoria	T. Redpath	First...	.75
Red Dutch	"	First...	.75
Stewarts	S. R. Spates	First...	.75
North Star	H. F. Bussee, Minneapolis	First...	.75

J. S. HARRIS, Judge.

GOOSEBERRIES.

Houghton	Gus. Johnson	First...	$ .75
Downing	"	Second.	.50
Smith's Improved	"	Second.	.50
Pearl	T. Redpath	Third...	.25
Houghton	"	Second.	.50
Pearl	S. R. Spates	Second.	.50
Smith's Improved	C. W. Sampson	First...	.75
Downing	"	First...	.75
Pearl	"	First...	.75
Red Jacket	"	First...	.75
Downing	H. F. Bussee	Third...	.25
Transparent	Jewell Nursery Co	First...	.75
American	" " "	First...	.75
Red Jacket	" " "	Second.	.50

J. S. HARRIS. Judge.

VEGETABLES.

Collection	H. F. Bussee	First...	$3.00

THOS. REDPATH, Judge.

MUSHROOMS.

Collection	Dr. M. S. Whetstone, Mpls	First...	$3.00
Collection	H. A. Strong, Minneapolis	Second.	2.00
Collection	Dr. G. A. Hendrix, Mpls	Third...	1.00

OTTO LUGGER, Judge.

APPLES.

ARTICLE.	EXHIBITOR.	PREM.	AMT.
Collection of seedlings	D. F. Akin, Farmington (Crop of 1898, kept in cellar)	Special	$3.00

WYMAN ELLIOT, Judge.

FLOWERS.

Swedish Black roses	D. P. DeLamater, Edina Mills	First	$ .50
Bouquet mixed flowers	H. W. Sherman, Excelsior	First	1.50
Beauty of Waltham, rose	Jewell Nurs. Co., Lake City	First	.50
Mabel Morrison, "	" " " "	First	.50
Anne de Diesbach, "	" " " "	First	.50
Magna Charta, "	" " " "	First	.50
Queen of Prairie, "	" " " "	First	.50
Princess Adelaide, "	" " " "	First	.50
Paul Neyron, "	" " " "	First	.50
Victor Verdier, "	" " " "	First	.50
La France, "	" " " "	First	.50
Genl. Jac., "	" " " "	First	.50
Crested Moss, "	" " " "	First	.50
Fisher Holmes, "	" " " "	First	.50
Collection of roses	" " " "	First	3.00

WYMAN ELLIOT, Judge.

THE NEW HORTICULTURAL BUILDING AND WHA IT REPRESENTS.

CLARENCE WEDGE, ALBERT LEA.

(Address delivered at Summer Meeting, 1899.)

Ladies and Gentlemen, Members of the Minnesota State Horticultural Society: At the end of this, our annual summer pilgrimage, we are met today to pay our vows amid these shrines and grounds devoted to the service of Ceres and Pomona. Since last we met we have watched through the long reign of cold and ice and observed with keen solicitude the trial of our works by the biting breath of old Boreas. Our eyes have once again beheld those resurrection days of nature which are a prophesy and an earnest of the greater day to come. And again with hope and joyful expectation we have begun our work among the fields, orchards and gardens, sowing the good seed in the cool, moist ground, planting the tender herb and fruitful tree, and practising those arts that "that do mend nature." As hand grasps hand today, and as we look into one another's faces and think upon the blessings strewn along the devious paths that have brought us to this place, we would not, we can not, restrain a thought of hearty gratitude to Him whose laws we study, whose fields we till and in whose groves we worship.

As horticulturists, as agriculturists and as fellow citizens, we seem, at this very time and place, to have reached an eminence of prosperity, a vantage ground of effort, that while it makes us glad

awes into solicitude that we grasp the golden opportunities and do deeds worthy of the day in which we live.

As citizens, we have seen our country's honor and glory burst forth in meteoric splendor and America take her place among the first in the council of the nations. We have heard the same bugle that called our hosts together sound the last requiem of a lost cause and blow the glad notes of a people reunited in affection as well as in name. We have felt the dark burden of doubt, distrust and panic, that has been so long upon our business enterprises roll away, and again shop and factory, counting room and office are throbbing with the mighty heart-beats of trade. And, best of all, we have seen the gathering earnestness of nations to unlearn the horrid arts of war, and increase and strengthen the bonds that may some day hold us in perpetual peace.

As agriculturists, we may not hold such brilliant trophies as the soldier and the statesman, but we, whose work it is to fill the hopper and the loom, freight the mighty ships and trains of commerce, and feed the mouths of hungry multitudes, are not unmindful of our more beneficent, if less splendid, victories of peace. After many failures and through many a rough and discouraging way, we have at last begun to learn co-operation, and with this first lesson of fraternal good will well learned we have lifted from our wives the opprobrium of "a household drudge" and found a golden market for the product of our herds.

To diversify your industries a new staple now appears upon the list of northern products. Beet sugar, which for so long a time baffled the skill of our best efforts to make it with profit, now seems about to take its place among the standard products of our farms.

Who can repress a thought of wonder as he sees a train of threshing implements, with all the puffs and bustle of the railway locomotive, passing along the quiet country highway, up through the stubble field, to the stacks of waiting grain? Where were these noble buildings twenty years ago? Where was agricultural education twenty years ago? Schools of medicine and law, schools of art and philosophy, and even schools of war existed away back centuries ago, but schools of agriculture, that art upon which all other arts depend, have been left for this present generation to bring to active usefulness.

When we reckon the trophies of agricultural progress, we will speak of wastes reclaimed, of heavy burdens lifted from aching shoulders, of finer flocks, cleaner fields, better products, better tools, but we will not forget that which holds the surest promise of advancement,—agricultural education.

As horticulturists we feel ourselves thrice blessed, for in addition to the trophies of the citizen and the agriculturist, in both of which we claim a full and equal share, there are some, peculiar to our art and our fraternity, which we hold with special joy. Chief among these is the orchard of apple and plum which, after the earnest and devoted work of many hands, we can, with confidence offer to the home makers of the north. True, our work in this is not complete and in some points is but just begun; but out of the trials of the

past, some things, so sturdy, so fruitful and so good, remain, and we have learned so much in the art of defending them against the severities of drouth and cold, that the home orchard, the delight of youth and comfort of the family, may now with confidence be placed about every rural dwelling.

We hold in special pride the work and standing of our state society, founded so short a time ago that we have with us, even yet, some of its very pioneers, now grown to be the largest society of its kind upon the continent And now our cup seems full as we feel the recognition that the citizens of our state have given our work in providing this new, commodious and beautiful building, that our youth may be more thoroughly instructed in our art, and that the strength and certainty of scientific investigations may be added to the horticultural resources of the state.

And so, my friends, as we gather here today, to lay this corner stone and count the progress of the past, the blessings of the present and the bewildering possibilities that lie almost within our grasp, we truly say: "There ne'er before was a June day that shed a kindlier, more auspicious light upon a goodly company."

I would not at this time draw any separating lines between the members of this company. Whatever the particular branch of the great family of agriculture to which you each belong, we meet here with the common instincts and interests of soil-tillers. We are all *followers* of that first-named, most necessary and most natural art of man. Although I have the feeling strong within me, I will not magnify our calling above all others. In this large world each man has a useful place, and it is a shallow judgment that names it high or low, for it is the way that place is filled which dignifies the station. He may fill it like a hero or a craven; he may be a true and useful servant of his race in any station and hear, almost before his work is closed, the welcome words, "Well done," or he may hide his talent in the napkin of morose envy and discontent and ever feel the loathsome poverty of a narrow soul. But withal, is there not a special honor that attaches to producers—those who cause two blades of grass to grow where before there was but one, those who make the perverse and barren soil to bring forth luscious fruits, cover the mountain sides with flocks and cause the waste fields to fill the gra naries of the earth?

Washington said of agriculture: "It is the most noble, useful and healthful occupation of mankind." Were all who come under its influence moulded into such a character as the Father of our Country, there would be none to dispute the elevating influence of our calling. But as we look upon Millet's famous delineation of "The Man with the Hoe," and realize how large a share of agriculturists it truly represents, we ask with Markham:

> "Who made him dead to rapture and despair,
> A thing that grieves not and that never hopes,
> Stolid and stunned, a brother to the ox?"

It is not race nor soil which has "shaped him to what he is," for we find such among all races and among the tillers of all soils; it is ignorance and the tyranny that always finds out ignorance, which has wrought the difference between Millet's man with the hoe and this group of men of the hoe which I see before me. That such a

type of man could till the fields and from them not only feed and clothe himself, but provide the bread for millions and furnish the "sinews of war" to the ambitious potentates of all the past, does not argue the essential meanness of the art but rather the bountiful kindness of the ground he tilled. Give that man the force of thought, the energy of hope, the joy of progress, and he will rise and take his place with us, and the products of his fields and herds will be the wonder of the world and, my friends, it is to further such a work, to bring about so beneficent an end, that we are met today.

Let us not minimize its importance, or fail to grasp the full meaning and glory of modern agricultural education. It is the bright particular flower of Christian civilization. The great teacher came not to the righteous, but to sinners, not to the rich and surfeited, but to the needy. Agricultural education does not come to such as the overburdened professions, upon which time has always lavished knowledge, nor does it say to the cultured: "Lo, a higher cult!" It comes to the man neglected by the past, the name of his occupation almost a synonym of contempt and says with truth:

> "I will straighten up this shape,
> Give back the upward looking and the light,
> Rebuild in it the music and the dream,
> Make right the immemorial infamies."

American agriculture has much before it of bright and immediate promise. Enlarged markets, which are surely coming with the enlarged influence of the nation, will make new demands upon our fields and flocks and stimulate new factories that use their products. The emigration which will seek our shores, to share in our prosperity, will bring us many more mouths to feed at home. New and better applications of force, and new forces that are upon the eve of overturning and transforming all the engines of commerce and cheapening transportation to a most wonderful degree, will bring the great markets of the world thousands of miles nearer to us and place our products before millions who have never enjoyed them before.

All this is sure to come, but it is not so certain that we as agriculturists will gain all the benefits that such opportunities should carry with them. That will depend upon our ability to measure up to the new demands upon us. The same cheap transportation which may carry our products, will carry the products of other nations, and our success will call aloud for better products, which calls for better methods, which calls for better men, and what but better education can give us better men?

What wonderful strides agricultural education has made these later years. There has been nothing like it in educational history, that we can remember. When I entered this very university as a student, some twenty-five years ago, there was no agricultural department organized, nor was there, in all the other colleges and schools, a place where practical agriculture was taught. The first great question that comes to every student when once the college doors are open to him, "What course shall I pursue?" was answered uniformly: "Lay a broad foundation, take the classical." It may have been the best advice that could have been given at that time,

but now, with many, very many, added opportunities, we realize that, however broad a foundation the noble Greek and Latin classics may be for the intended literary or scholastic career, however valuable the ability to express thought clearly may be to all men, the foundation is a very narrow one upon which to begin what we may call the common and most necessary articles of life, and not only is this so, but its influence is ever away from that close connection which should always exist between knowing and doing—a training of the thought at the expense of the executive capacities.

We understand that the classics are not so popular as formerly, that even among the best students, who do not desire to shirk hard work, there is a growing disposition to turn to other lines for mental discipline. This seems to us both well and natural, and we think that when the agricultural course has been fully developed there will be no line of training which will offer so complete a discipline of all the faculties that go to make a perfect man.

Time was when education seemed for the few and, in a sense, to enable these few to maintain a precedence and tyranny over the many. It is the peculiar glory of all modern educational methods that they reach down to the needs and abilities of the many and endeavor to overcome every natural obstacle between them and the enjoyment of the highest privileges. The management of the Minnesota School of Agriculture has been most felicitous in this particular, as it has not only succeeded in interesting the young, and arrayed its work to suit the time the pupil may have at his disposal, but has, through its published bulletins and the outside work and efforts of its teachers, made even the fathers and mothers feel that they are not too old to learn.

In one of the recent issues of our country paper, I was pleased to read the notice that at a late meeting of our local dairy association there was a discussion of the best time and way to organize an excursion to the School of Agriculture. Such straws show a very different wind from that which blew, not many years ago, when the suggestion of a trip, a hundred miles from home, to see how professors of "book farming" carried on their work would have been met with uproarious ridicule. While we may thus enjoy the good days that have come to us and the pleasing prospects of the future, we must not forget that there remains for us yet very much land to be possessed. When every intending farmer enters his career with such special training and preparations as are considered necessary to the man who enters a profession; when our horticultural society numbers on its roll every orchardist and gardener; when that grand school for older heads, the farmers' institute, gathers to its stimulating instruction every farmer in the state; when every rural home is provided with those comforts and attractions which we expect to find about the city residence, then, perhaps, may we rest content, or look about and sigh for other worlds to conquer.

My friends, this is our day, this is our field in which to labor. There is none fairer nor more worthy of our toil. Let each till well that portion allotted to him, until the shadows gather, the dews begin to fall, and the "Night cometh when no man can work."

LESSONS FROM THE WINTER OF 1898-9.

J. S. HARRIS, LA CRESCENT.

(Read at Summer Meeting, 1899.)

The winter in our section of the state went on record as having a temperature for a few days, between the 7th and 12th of February, as low as any recorded, even in the most disastrous winters of 1872-3 and 1884-5, but the damage done to fruit trees and plants was slight compared with that on those memorable occasions, and the lesson taught is that it is not extreme cold alone that is responsible for the wholesale winter-killing of trees and plants during certain winters, but more the atmospheric, meteorological and soil conditions of the previous season and following spring or, perhaps, the conditions and surroundings of the trees during the extreme cold.

A severe drouth had prevailed in the late summer and autumn of 1872. Winter set in without any moisture in the soil, and there was no snow covering the surface of the ground until about the second week of January, 1873, and the ground was frozen to a depth of five to seven feet. When spring opened the trunks and branches of trees were apparently uninjured, but the roots so badly killed that few ever started into growth.

The latter part of the summer of 1884 was very dry, greatly checking the summer's growth of trees, and cool weather and frosts occurred in August, causing many trees to begin to lose their foliage. This was followed by heavy rains in the first week of September and continuous warm weather for two months. A new growth started on trees and plants, and many of them blossomed and set fruit. About the middle of November there occurred a severe frost that caused bark-burst on many young trees and discoloring the wood in the forks, or axils, of branches of nearly all varieties of apples, greatly reducing their vitality. The cold of the following winter was not more intense than that of last winter but of longer duration, and with it a peculiar storm wave that extended from Dakota to Ohio. When spring opened it was found that great numbers of our trees were killed to the ground or so badly injured that there was no hope of their recovery.

The full extent of the injury of the past winter cannot yet be determined, but evidently it was slight compared with the winters above mentioned. Nursery stock was very generally more or less discolored in the last season's growth and in the axils of the branches, but the spring and season so far has been very favorable, and reasonably hardy trees are growing from the terminal buds and making a layer of wood under the bark over the discolored parts. There is likely to be a considerable number of what are termed black-hearted trees among those that will be offered for sale during the next year or two, and many of them may prove a disappointment to planters that if they could remain undisturbed would be long lived, useful trees, especially so if the remainder of the season is favorable and next winter not an unusually severe one. Should the present moist term be followed by extreme heat and a long drouth through July and August, I think that many trees that do

not show much injury at present will develop canker and frozen sap blight, and should next winter prove a severe one will yield up the ghost after one attempt at fruitfulness.

One lesson from the winter may be that it is unwise to allow trees to overbear. On my place, at La Crescent, old trees of Duchess, Fameuse and some others that fruited very heavily show that they were overtaxed and are going into decline, while trees of most of the same varieties, from five to ten years old, that did not bear very much look vigorous and healthy and are making a strong growth. Another lesson of the winter is that orchards located on elevated lands with northern aspect and clay and limestone soil, will withstand the rigors of a winter like the last much better than where located on lower or level valley lands or southern slopes.

The winter was not unusually severe on injurious insects. The plum curculio, apple gouger and codling moth are more numerous than I have ever before seen them, while for some reason insectivorous birds do not appear to be as plentiful.

TREATMENT OF THE BLACK RASPBERRY FIELD DURING HARVEST.

R. A. WRIGHT, EUREKA.

Now if I were to tell you how I treat the black raspberry field during harvest in a season when there is plenty of rain, a very few words would express it all. I simply cultivate once in ten days, to keep the weeds down. During a dry season, however, much more time and labor are required to get the best results from the berry field. As I am a firm believer in the dust blanket to retain moisture, I plan by cultivating to keep a good blanket of that sort in my berry field. To keep the surface of the soil well stirred, I run my twelve tooth cultivator through the field about every other day, or right after each picking, as the pickers always pack the soil more or less, and by cultivating about two inches deep, the field is in pretty good shape to withstand the drouth. The quality and quantity of fruit harvested fully repay for the extra labor. Although it is not customary in our locality to cultivate the berry field during harvest, I have proved to my satisfaction that the dust blanket pays.

Mr. C. L. Smith: I want to ask Mr. Wright if he can keep up the size until the close of the season by following his plan of cultivating?

Mr. Wright: Much better than without cultivation.

Mr. Taylor: What varieties of blackcaps do you raise?

Mr. Wright: The Doolittle—I have discarded the Doolittle—the Hilburn, Souhegan and Nemaha, but I have about given up blackcaps.

Mr. C. L. Smith: Why?

Mr. Wright: On account of disease. Disease has taken hold of all of them. I found the Souhegan and Nemaha the most profitable, especially the Nemaha,

ANNUAL MEETING, WISCONSIN STATE HORTICULTURAL SOCIETY, 1899.

J. M. UNDERWOOD, DELEGATE.

On arriving in Madison, we went to the Capitol, where entertainment was provided for us, and where we met many of the members of the society from different parts of the state. This feature of the Wisconsin meeting is one that is very pleasant, and one that we in Minnesota will do well to follow. So many coming together for their meals adds a social charm that cannot be had in any other way.

The meeting was held in the basement of the Capitol. The rooms that had been formerly used were not available. Our sister society is like ours in that it has no home wherein to meet, and there should be something done by both societies to change this condition of things.

The attendance was about the same as at our meeting, and the carrying out of the program could not be criticized. The five-minute papers were an attractive feature, and time was promptly called on all the speakers.

The compliment was paid Mrs. Underwood and I of making us honorary members for the year, and we were urged to participate in the discussions.

An interesting report of the Wisconsin exhibit of fruits at Omaha was made by Messrs. Hatch, Philips, Toole, Coe, Kellogg and others. The exhibit was made by direction of the society, and the total cost was $818.21. While it was not as large as those of some other states, the great number of varieties and the character of the fruit was such as to win for it many praises, and although gold, silver and bronze medals were awarded not even leather has been received.

Mr. Philips' report of the new trial orchard was interesting. This orchard is under the control of the society, and the expenses are met by the state. The orchard is located near Wausau, on high ground with clay sub-soil, and should prove of great value in testing the different varieties and establishing their value.

The subject of top-working was an interesting topic. The Virginia was given the preference as a stock, but there was some objection to it on account of its blighting.

In discussing the printing of their magazine, it was stated that it

cost for printing		$309.21
Salary of editor		200.00
Illustrations and postage		38.98
Incidentals		40.00
Total		$588.19
Receipts for advertising	$ 27.50	
Subscriptions, etc	65.52	
304 subscribers	304.00	
	$397.02	

The committee on observation reported the Warfield and Bederwood as the most profitable strawberries, the Northwestern Greening as the best winter apple, and that it is desirable to spray for the codling moth.

In the reports from local societies it was shown that there is a great deal of interest taken by the members in local organizations, and I was impressed with the thought that it is done at the expense of the state society. Having given their time and money to the local society each month of the year, they find less time for work and interest in the parent society.

On the subject of picking and marketing apples, it was recommended by several members as follows:

Mr. Hirschinger: "Draw on a boat to a shed to sort; face both ends of the barrels; sell in car lots; use refrigerator car."

Mr. Barnes: "Pick and put in a cool shed; sort and sell each grade by itself; make firsts sell the seconds; sell culls for what they will bring; do not mix red and green apples.

Mr. Hatch: "Pick when the seeds are brown; go over the trees two or three times if necessary; use one-half bushel basket to pick in; do not pack windfalls; face both ends of the barrel; put in a bushel and shake the barrel, then a half bushel and shake the barrel and so on until the barrel is full; head the barrel in the orchard; pick cool, pack cool and keep cool; ship summer apples in ventilated barrels; it does not hurt to pick apples when wet."

Prof. Goff: "Apples should be sorted better; do not crowd in poor or small apples; sell them as firsts and seconds. Make your own barrels." He ordered a car load of material, paid 6 cents and board for making, or 7 cents and the man boards himself. Cost of the barrel, less than 20 cents each. Apples sold from $1.50 to $3.50 per barrel. He recommends spraying for the codling moth.

Mr. Reed recommends the local markets as likely to bring the most money.

It was reported that 100 cars of apples were shipped from Baraboo last fall, forty cars from Waupaca and 2,500 bushels from wagons.

On Wednesday and Thursday, the young men of the horticultural school were excused from their studies to give them a chance to attend the meetings of the horticultural society. Led by Prof. Goff, they gave an added interest to the meetings. The professor made a strong plea for a better quality in fruits. In the discussion that followed, it was claimed that quality was sacrificed for hardiness.

On the subject of currants, J. S. Stickney, speaking from twenty years' experience, "recommends deeply trenched soil; would not manure too heavily; too much wood, too little fruit; prune severely in fall or spring, also in summer for renovating old plants; eight acres of Prince Albert produced 900 bushels, that netted $200.00; long Bunch Holland not good—too dry and sour; Fay not good; is looking for a new variety; Pomona recommended as good, better, best; Wilder highly recommended." Mr. Reed says Pomona, Wilder and Knight's Improved are the same. Mr. Stickney and also Mr. Barnes recommend London Market. Berry boxes in sixteen quart crates recommended for currants.

Wednesday evening the society met in "Assembly Hall."

Wm. Toole, of Baraboo, who is a specialist in growing pansies, read a very interesting paper on their growth and management. To him the grotesque features of his pets become animate and infuse the life and interest that make him wonderfully successful in their cultivation.

Dr. F. E. Loope spoke of the interesting discoveries he had made of new varieties of apples found growing in fence corners and lonely burying-grounds; emphasizing the opportunities that we all have for developing new varieties by planting seeds from the hardy varieties of apples.

F. H. Chappell, the white-haired veteran, was interesting in his paper on the "Mistakes and Failures of Fruit Growing." Some make sport of his mulching apple trees with sand, but they do not stop to see that the sand makes a loose mulch that readily takes up all the moisture that falls, and then it is so loose that it holds it in check and prevents evaporation. It takes the place of surface cultivation and secures the trees against drouth—the great enemy to success. "Go thou and do likewise."

Prof. N. E. Hansen, of the Brookings (S. D.) College of Horticulture, gave a most interesting account of his trip to Russia. Among the many valuable suggestions he gave was of the value of the Vladimir cherry, which should be grown from the seed and not budded or grafted; another was of the value of growing apple trees here by using the Pyrus baccata for a stock; they will be hardy, will not root kill, will withstand drouth well and will bring the tree into bearing one or two years earlier than any other stock.

THURSDAY, A. M.

Prof. Kellogg gave a very interesting address on the work and growth of the society. The secretary's report showed

Receipts for the year	$2,738.48
Expenses	2,610.20
Balance on hand	$128.25

In the exhibition room there were three long tables of fine winter apples, and among those that were given first premiums were the Avista, Eureka, Fameuse, Grimes' Golden, Golden Russet, Hibernal, Longfield, Malinda, McMahon White, N. W. Greening, Newell's Winter, Pewaukee, Repka Malenka, Scott's Winter, Talman Sweet, Utter's Red, Walbridge, Wealthy, Windsor, Wolf River.

The following is a synopsis of the expressions of some of the fruit growers of their preference for different fruits in the order given and with other recommendations:

PLUMS.

Mr. Cranefield: Quaker, Ocheeda, Berkman, Dewain, Purple Gage. Burns brimstone under the tree for curculio. Sprays with tobacco and Paris green.

Mr. Guilford: De Soto, Rollingstone, Forest Garden, Hawkeye, Wyant, Wolf.

CHERRIES.

Mr. Tarrant: English Morello, Early Richmond, Ostheim, Wragg.
Mr. Moyle: Shadow Morello and Large Morello.
Mr. Barnes: Early Richmond.

BEST WINTER APPLES.

Mr. Chappell: Louisa, Dominion Winter, Murphy's Blush, Custer's Golden Sweet, Vick's Seedling.

A. D. Barnes: Northwestern Greening, Talman Sweet, Walbridge, Pewaukee, Ben Davis.

G. J. Kellogg: Avista, Northwestern Greening, Windsor, Eureka, Newell's Winter.

F. C. Edwards: Northwestern Greening, Windsor Chief, Willow Twig, Talman Sweet, Pewaukee.

A. L. Hatch: Can't grow a winter apple away from water. No one can name five varieties.

Mr. Hirschinger: Scott's Winter, Newell's Winter, Northwestern Greening, Borsdorf, Fameuse.

A. J. Philips: Northwestern Greening, Avista, Walbridge, Eureka, Malinda.

Mr. Johnson: Snow, Wealthy, Walbridge, Talman Sweet, Willow Twig, Plumb Cider.

In the election of officers Mr. Kellogg declined to accept a re-election, and Mr. Johnson was chosen. Mr. Philips was re-elected secretary and treasurer.

In closing this report of the meeting, we wish to acknowledge the kind and generous hospitality of the members of the Wisconsin Horticultural Society, and to wish them, one and all, unbounded success and prosperity in their work.

LEGAL PROTECTION FOR THE ORIGINATOR OF A SEEDLING FRUIT.

A. B. CHOATE, MINNEAPOLIS.

At your last annual meeting I had the pleasure of addressing you on the hobby which I ride in my leisure hours, the "Good Roads" question. At that time I did not exactly apologize for being a lawyer, but I explained to you that I once occupied the honorable position of agriculturist, and that my legal education had been grafted on agricultural stock. Perhaps it was because I am so much of a hybrid myself that you invited me to discuss a question which calls for the special learning of the legal profession as well as knowledge distinctly horticultural. It is nothing for a lawyer to be obliged to handle an intricate subject which is not a purely legal one in an intelligent manner. A general practicioner of law is called upon to help people of all occupations out of business troubles, and in order to do so he must familiarize himself with the business in which these troubles arise. One day he may be called upon to untangle a complicated title to real estate, the next day it may be a question involving the intricate workings of the human nervous system, and from that he may be asked to mix up

in a difficulty concerning the ancestry, heredity and the consanguinity of some seedling plant whose parentage is in dispute. So it happened to me. About two years ago, while I was wholly absorbed in studying the workings of a hydraulic elevator, which it was claimed had fallen from the fourth floor to the basement without any scientific excuse,—while I was pondering over the conflicting expert testimony which proved conclusively that the hydraulic elevator had been guilty of doing what a hydraulic elevator could not possibly do, one of my clients called on me and sprang a puzzling lego-horticultural question on me.

Two men, living about thirty miles apart, claimed, that while working independently they had originated valuable seedling plants which appeared to be of the same variety. About one hundred miles from either of the alleged seedlings there were several thousand yearling plants which each man claimed were regular descendants of his particular seedling. One of the men claimed that the other had no seedling at all, but had secured slips from his seedling and propagated the yearlings a hundred miles away without authority. The question was, could the sale of the yearlings be enjoined and further propagation be prohibited? But since a thief cannot be hung until he is caught, the first question was, could it be proven that the yearlings were descendants of the seedling my client was interested in? The first thing I did was to go to Secretary Latham for an answer to the horticultural question, and to a forty thousand dollar law library for an answer to the law question. Secretary Latham told me frankly that he did not know and advised me to see Prof. Green. Prof. Green did not deny that he knew all there was to be known on the subject, but it was like pumping water out of a dry well to get him to tell. By vigorous pumping, however, I succeeded in getting Prof. Green to make an affidavit which, to me, meant that, taking all things into consideration, it was his professional opinion that some things are highly improbable. Prof. Green's affidavit set forth (at my request) his very extensive experience and opportunities for acquiring knowledge upon the question involved, and by reading this affidavit to the judge with great force and solemnity, I succeeded in getting the judge to rule that Prof. Green was probably correct!! I remember, that at that time I thought Prof. Green was rather unwilling to help me, but I have concluded that his apparent equivocal attitude was not so much due to unwillingness to aid me as it was to his regard for his professional standing when making a sworn statement about a matter concerning which absolute knowledge was practically out of the question.

There is no statute in this state, nor in any other that I know of, which attempts to give protection to the originator of a seedling. But, after careful consideration, I am of the opinion, that independently of any statute, by common law in this state a man who originates a seedling plant is the legal owner of such seedling and may absolutely prohibit any one else from propagating any plants from it, and may exercise as absolute control over the seedling and its increase and the disposition of such increase as he may over a do-

mestic animal which he owns; and if any one gets possession of buds or slips without the originator's consent, or having lawfully gotten possession propagates others without the consent of the originator, either express or implied, he may be enjoined from propagating or selling them, and is liable for any damages which the originator may suffer thereby. But if the originator sell any of the products of his plant, without limiting the purchaser in his right to propagate and sell, then the purchaser has, by implication, an unlimited right to do as he may see fit with his purchase. It was upon this theory of the law that I secured a temporary injunction, prohibiting the sale of the yearlings in question until their ancestry could be determined by a trial in court.

The difficulties of protecting the originator of a seedling are more of a practical than a legal character. The case in question is a good illustration of the complications likely to arise. You will remember, the seedlings were thirty miles apart, and the yearlings were about a hundred miles from either of the seedlings. This gave a variety of soil, climate and exposure. The yearlings had borne no fruit, and the character of the stock on which they were propagated was unknown. There had not been sufficient experiment to demonstrate to what extent this seedling had the power to transmit its individuality to its descendants. I understand that this power varies in different varieties of plants, and that sometimes entirely new varieties are formed by asexual propagation.

I got the trial of the case continued so as to have the benefit of a fruitage of the seedlings. But the grandchildren of my client's seedling were wayward, and apparently unconcerned about assisting in determining their ancestry, for while they closely resembled the fruit on the parental tree, they were different in complexion, more sour in disposition and not so prompt in getting down to business, that is, they were about two weeks later in ripening. This only complicated matters.

When you take into consideration all the varying conditions and elements which may enter into any particular case, and when you bear in mind that legal protection will generally be desired at just the period in the history of a seedling when its characteristics are least known and hardest to establish, and at the time when the alleged descendants are themselves undeveloped and their characteristics are little known and hard to prove—when all these matters are taken into consideration, I am sure that those of you who have given such things the most attention will agree with me that to prove to a legal certainty the ancestry of fruit plants is likely to be one of the most difficult tasks imaginable.

Although Prof. Green had seen our seedling and had also seen the trees which we claimed were its descendants, I was unable to get him to say, that in his opinion, they were of the same variety. And since I have learned something about this subject, I have forgiven him for refusing to say so, for I am convinced that he came as near saying it in that affidavit as he safely could.

I shall refrain from giving you a lecture on plant heredity, for I have learned just enough about horticulture to know better than to

stand up before horticultural experts and try to tell them anything about it. I think I have said enough to call your attention to the practical difficulties in the way of giving legal protection to the originator of a seedling plant.

When you, gentlemen, get the questions of individuality and heredity of plants settled, and become so expert in distinguishing them that you can give the courts definite and positive testimony in regard to the ancestry and consanguinity of all the little plant waifs which are continully presenting themselves for classification, I assure you that the courts will furnish legal protection to the midwife who officiated at the conception and birth of the waifs.

The President: Mr. Choate, may I ask if there is any legal protection for a variety under a specific name?

Mr. Choate: I suppose you refer to the question of the name adopted by the originator. There is protection for that.

Mr. Bush: Such protection would consist of the trade mark right?

Mr. Choate: Yes, sir; and protection would be given where there is no trade mark.

Mr. Philips: If I find on another man's farm an apple that I find is a seedling, and I purchase that tree and the sole right to use it, cut scions and propagate it, pay for it and take his receipt, would I be entitled to the same protection in putting that tree out as the man would be who planted the seed?

Mr. Choate: Yes, I think you would.

Mr. Benjamin: There is another point about which I would like to ask a question. Suppose I find a seedling growing on a neighbor's farm and obtain scions, either by gift or purchase, and afterward he wishes to control the propagation himself, can he control the product of those cions I received from him, even though he may have given them to me?

Mr. Choate: I think when you purchase anything without limitation it becomes your property to do with what you please. Whenever those cions become yours, they become yours for all purposes.

Mr. Philips: They are yours unless you stole them. They do that sometimes. (Laughter.)

Mr. Yahnke: Referring to Mr. Philips' case, how would it be in case that man sells the place from which I have bought the tree? How would that affect my right. That is, in case he sells his farm where the tree stands, what can I do about it?

Mr. Choate: Well, you buy the tree with the farm, and you do what you please with it.

Mr. Philips: If I buy the tree from the present owner it is mine, but if he sells the place on which the tree stands to another man what am I going to do then?

Mr. Choate: You should remove the tree before the other man gets possession.

Mr. Yahnke: If I buy a seedling tree, and after I begin to propagate it I find two or three other parties have got it, can I shut them off?

Mr. Choate: If they came lawfully in possession you cannot stop them from selling.

Mr. Yahnke: If I prove they stole it can I get possession?

Mr. Philips: Yes, if you can convict a tree grower for stealing.

Mr. Peter M. Gideon: When I sell a seedling tree I sell so many cuttings off with the privilege of cutting cions for two or three crops, and then it goes out to the world. Now, the multitude of seedlings that are coming into bearing every year will undoubtedly produce some apples closely resembling one another. I have seedlings that are entirely different, the appearance of the tree is different, but the apples would pass for the same every time. They are the cases that get mixed up. I have sent out 60,000 seedling trees. Those produced thousands of varieties that so closely resemble each other that no man living is able to tell them apart. It would be nonsense to fence every man in that got the first seedling apple, because he might have forty others equally good; so I say let each one propagate. When I was propagating my seedling apple trees and sending them out, I calculated to make something just on the first setting of the variety in the nursery. I never limited any man in the propagation of it. He had perfect liberty to propagate it as fast as he could. Other apples might come in that might look nearly like it. A man might claim different origin, and it might create endless litigation. But no apple goes out from me that will ever produce litigation so far as I am concerned. I do not calculate to let them out in that way. All I make from an apple is from the first setting I sell. Suppose the Wealthy had been put out in that way, and no one had the right to propagate; here comes in the Peter, which is so nearly like the Wealthy that it might result in an endless amount of litigation. I do not believe in any protection whatever beyond the sale of the first lot of trees sent out. I do not believe there should be any limitation placed on the sale of any tree. That is the way I have done. (Applause.)

Mr. Hartwell, (Ill.): That accounts for the hearty handshake this morning. (Laughter.)

Mr. Harris: I am a prohibition-democrat. I believe if I buy anything it is mine. If I had bought one of the first Wealthys, I had as good a right to propagate it as Peter M. Gideon. I do not believe it is in the interest of progressive horticulture to give any protection to a variety after it has gone out of the hands of the producer and originator. However, the more he gets out of it the better, but in the interest of progressive horticulture after a man has bought a thing he ought to have the right to do what he pleases with it.

Mr. St. John: I have my doubts about there being such a thing as a prohibition-democrat. (Great laughter.)

ADDRESS OF PRESIDENT-ELECT.

W. W. PENDERGAST.

(At late annual meeting.)

Mr. President, Friends and Fellow Members:

I will not deny that this election has pleased me very much indeed, and I feel profoundly grateful to you for this proof of your confidence. I have been a member of this society for a good many years. I never have asked for and never expected any office whatever. I was willing to take my share as a simple worker to try to help the cause along as well as I could. I believe that in a society of this kind every one should be willing to

> "Watch intent and firm of mind,
> And watch where'er the post's assigned,
> And leave to God the rest."

You have assigned to me this post, and I shall try to do the work as well as I know how. I do not expect to drop right into the traces and pull as steadily and do as well as Mr. Underwood, who has been your president so long, but as far as I can you have my word that I shall do my level best.

I want to say further what I said once before, that in this great state of Minnesota there are three organizations that I have had in my mind as doing, each one in its own way, a great work for the state, with the sole object of doing good. One is the Teachers' Association. Every year the teachers of this great state come together and devise ways and means by which they can lift the state up a little higher educationally, and they are doing it. There is the State Dairyman's Association, that is lifting it up financially, and it is doing a great work. It is saving our farms from destruction; it is saving the fertility of the soil that we have been exporting year after year; it is making a record that we shall be proud to deliver to our children when we are gone. There is the Minnesota State Horticultural Society; I mention it last but not least, because it is the one we are most concerned in here. We are here for service to the state, and, incidentally, to the whole land. The hightest aim that any man can have in this world is to place himself in position where he can best serve his fellows. (Applause.) One man said to me, "I do not care about my boy being able to serve somebody else, I want him to serve himself." Oh, what a fearful mistake that man made! He can never serve himself well until he has learned to serve his fellow men. "If any one be great among you let him be your minister." If you can point me out a man who has been great in this country or in the world, that man has been a good minister; he has ministered to the wants of the people, he has been a good servant. Was Lincoln a great man? It was because he was a splendid servant. Was Washington a great man? It was because he served his country well. Is there any one who has won world wide fame? Point him out to

me, and I will show you a man who has served the world well and advanced it. We are trying to carry joy, sweetness, light, comfort and beauty into every home in this great state of Minnesota, and we have abundant reason to be encouraged in what we are doing. I can remember when this society consisted of just a handful of men, and I am glad to see them here today, These men were interested in this great work thirty and forty years ago, and they have stuck to it through thick and thin; nothing has daunted them, and they have worked for the good of the cause with just as good vim and earnestness and pleasure as they had in the beginning—I think more, because every step that we take shows that we are advancing. Very many of us are getting gray, we are getting old, but our horizon is broader, avenues are opening up in this direction and that direction, and we can see a wonderful prospect spread out before us.

You were speaking yesterday when I came in here about work in the schools; the schools are going to take it up. I have been asked a great many times if I did not believe a separate text book should be put in for horticulture. At the present time I would say, no. We cannot have a text book on forestry, on horticulture, on agriculture, for everything that people think should be taught in our schools, but we can train the boys and girls in their nature studies, in their field work that we are turning attention to now all over the state, we can train their thoughts in the right direction, we can set them to thinking on these things. We can place no limit to an education. When a boy graduates from the University of Minnesota he has an education only to fit himself to keep on educating himself and thinking on in the right direction, thinking to a finish upon everything that is laid before him that is worth his thought. And that is the way we are going to put this into the public schools of the future, and it is going to cover not only horticulture, but forestry and agriculture, and it will cover all these nature studies; we will put them all together, and the boy will see things in nature that will be worth something to him. The good time is coming, is right upon us; all we have to do is to work until we reach perfection.

Mr. Hartwell, (Ill.): I want to express my appreciation of the words just spoken by your newly elected president. As I understand it, you are here in part to express your sympathy with this idea of putting your public schools in relation to this horticultural society. You have elected the state superintendent of instruction as president of this society. To me it is a great outlook, and I want to express my feelings more emphatically by asking the secretary to enroll my name in the list of life members of your society. (Applause.)

Trial Stations.

MIDSUMMER REPORTS, 1899.

CENTRAL TRIAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

The winter which we have just passed through was unusually severe, and had it not been for the fact that our soil was well filled with water, and that we had a fairly good covering of snow upon it, we would have had much more injury. Where the conditions were not as favorable as here, as in parts of Wisconsin and central Iowa, injury to vegetation has been very severe. With us there has been no more root-killing than usual, and our hardy varieties of plants have come through the winter in quite satisfactory shape. The wood of our apple trees was more discolored than usual this year, but of those varieties that we regard as hardy it has started a vigorous growth and is now in excellent condition.

Among the plums there is not a variety of the domestica class left in good condition, and many of them are killed to the snow line. The Chickasaw class of plums is also badly injured. A lesson that would seem to have been enforced by the winter is that the plums for this section must come from the Americanus class. Our small fruits came through in good condition where they had the usual wintering, and the outlook now for raspberries, strawberries, grapes, currants and gooseberries is unusually good. Our apricots were all severely injured, and some of them killed back to snow line. Of our cherries few varieties have set fruit, and nearly all were so severely injured in the fruit bud that we can expect but little fruit from them this season.

Among the shrubs many varieties were killed back to the snow line this winter which previous experience, for seven or eight years, had seemed to show perfectly hardy. A more detailed report of these, and general results of the winter, will be made in bulletin form later on, so there is no need to refer to them here at greater length.

The last legislature appropriated money for a new horticultural building, and work was begun on it about the 7th of June. This will give excellent quarters for the division of horticulture, both of the school and station, and for botany and physics, and will increase the accommodations for chemistry and entomology and zoology and is a great addition to the equipment here.

EUREKA TRIAL STATION.

C. W. SAMPSON, SUPT.

The outlook for the fruit crop is a big one. All kinds of small fruits and grapes seem to have come through the winter in excellent shape and promise a bountiful crop. Strawberry plants that had no protection whatever came out all right, owing to the deep covering of snow. Raspberries, blackberries, currants, gooseberries and grapes all promise a good crop. Apples are fairly well loaded, and plums bid fair to ripen a big crop.

I have sprayed my apples and plums three times and fought the curculico, so that I expect a fine crop of plums. I find that by going out early in the morning and jarring the trees I can kill a good many of them.

I have found that a good way to keep apples in perfect condition is to pack them in air-slaked lime. Put in a layer of apples in the barrel and then cover them completely with lime and keep on until the barrel is full.

I believe the apple industry has only just begun in Minnesota, and in a few years we will see car loads of the finest apples in the world raised here. My Compass cherry trees set out last spring are well loaded with fruit and are not injured with the curculio or other insects.

EXCELSIOR TRIAL STATION.

H. M. LYMAN, SUPT.

Fruit trees at this station are generally looking well. The past winter has not been as hard on them as some thought it would be. The season last fall was favorable for ripening the wood, and they were able to withstand quite a degree of cold for several days or even weeks together. If it were not for that milder spell between those extremely cold days the injury would have been far greater. As it is, only the more tender varieties suffered.

Most of the Russians came through well. The Lowland Raspberry is discolored some. Other varieties are all looking well. I have a few trees of Northwestern Greening; it is not considered very hardy. The Wealthy came through in good shape, also the Okabena. The McMahon appears to be in good shape; the Utter did not fare as well. The Charlottenthaler is hardy and will, I think, take the place of Yellow Transparent, which blights badly. Apple trees have set for a fair crop, while plums are loaded with fruit.

LA CRESCENT TRIAL STATION.

J. S. HARRIS, SUPT.

The season of 1898 went on record as an unusually fruitful one, especially for most varieties of strawberries, grapes and apples. Grapes and apples had been allowed to overbear, which, with other unfavorable conditions, taxed the vitality of the trees and plants severely. The rainfall of the season was from six to eight inches below normal, and the end of the season found the growth only

moderate, but generally well ripened up. Following conditions were most favorable, or we might have experienced a repetition of the wholesale slaughter of 1872-3 or 1884-5. If copious rains had not fallen it would have caused root-killing, or if the rains had come but a few days sooner and been followed with a temperature high enough to start a new flow of sap and growth, it would have caused top-killing. Although portions of the winter were extremely cold and the ground not covered with sufficient depth of snow to keep out frost, the roots of trees and plants were not injured in the least and were able to afford moisture to supply the loss by evaporation, and in the coldest weather the frozen wood did not show the shriveled condition that we have often noticed during some previous hard winters. Doubtless, also, the conditions of the spring may be set down as favorable.

STRAWBERRIES—Strawberry plants wintered perfectly, whether covered or not; if there was any difference, it was in favor of the uncovered or most slightly covered. Plants bloomed heavily and set well, with the promise of a phenomenal crop, but excessive rains since the latter part of May, warm, cloudy weather and the great electrical storm of June 11th, has greatly injured the crop.

The Clyde is a very strong grower, and this season is out-yielding every other variety. As usual, the Bederwood is yielding well and showing itself to be about the best early berry for the farmer. We had thought of discarding the Rio, but this season it is proving to be one of the very best early berries.

Glen Mary is a strong healthy plant; fruit large and abundant, not as good or attractive as the Clyde. Nick Ohmer is a giant among plants; fruit large and fine. Splendid is maintaining its reputation and ought to have a place in every plantation. We have no further use for the Michel's Early. It is only valuable as a pollenizer and to give one or two light pickings of very fine fruit. The Sparta is not satisfactory on our soil. Several newer varieties have been planted for trial. The season of ripening is one week later than last year, and full results cannot be given at this date, June 15th.

RASPBERRIES—We do not usually lay down and cover our raspberries. Old plantations of blackcaps, with the exception of the Older, suffered more than in any winter since 1884-5, and will not bring a half crop, and all reds, except Loudon, Miller and Red King were killed badly; the Cuthbert so badly that there will be scarcely any fruit. A plantation of the Loudon, without any protection, wintered perfectly and promises a fine crop. The King is also a very promising variety. Blackberries of all varieties killed worse than we ever had them before.

CURRANTS that were infested with worms last year were injured by the winter. Other stood the winter well and are producing a fair crop. The Red Dutch is not doing as well as the Victoria, Prince Albert and Long Bunch Holland. A few plants of Pomona, Moore's Ruby and Fuller were planted last year, of which the Pomona is the most promising. The plant is vigorous and productive.

GRAPES—The crop of grapes in 1898 was immense. This year we expect less than a half crop. All varieties were somewhat injured.

The new Campbell's Early stood the best of any, and the Concord, Moore's Early and Worden fairly well. Brighton, Lady, Pocklington, Moore's Diamond, Agawam, Delaware and many others killed to the ground. The loss to grapes was greater, because the prunings were removed and soil left bare and clean, and the ground froze so early that they did not get pegged down so closely as is our usual practice. Although the leaves and prunings afford shelter for insects and vermin, unless the vines are laid down and covered with earth it is better to let them remain until spring.

APPLES—Hardy varieties of apples in orchards on elevated lands do not show much injury from the winter, but the more tender varieties, while growing from the terminal buds, have the wood considerably discolored, and there is some loss of trees in valleys and sheltered locations. We have lost a considerable number of trees of the Russians sent out from the state station by Prof. Porter a number of years since, but do not consider them any great loss, because they were bad blighters and shy fruiters. Unfortunately, the names of many of them were lost. Among the dead or fatally injured are Sweet Pipka, Skrout German, Stepka, No. 1056, Holdfast, and Ostrohoe. A number of Duchess that bore heavily last year are looking very sick. Russians that do not show any injury are Anisim, Antonovka, Charlamoff, Cross, all of the Hibernal family, the Anis family, the Ostrokoff and Czar's Thorn. The injury to Longfield is very slight. While very hardy the varieties of the Anis family have no value for planting in this part of the state.

The Jonathan, Ben Davis and Grimes' Golden are very badly injured, while Fameuse, White, Walbridge, Scott's Winter and many others are likely to fully recover.

In newer varieties, the Patten's Greening, Okabena and Nelson do not show the slightest injury, and the North Star and University (Patten 102) are very promising. Not a tree on our north slope hillside orchard of more than a hundred varieties was killed, and very few show any injury.

Losses in the nursery of one and two year old trees were considerable. Although with few exceptions the trees were inclined to start and grow from the terminal buds, the wood is apparently dead at the heart to within a few inches of the ground, and it has been necessary to cut them back to sound wood to avoid having black hearted trees. Most of the Siberian hybrids and the Anisim, Charlamoff, Duchess, Patten's Greening, Hibernal, North Star and Christmas, are about all that do not need any cutting back. Babbit, Springdale, Shakleford, Ben Davis and Ethlys are the most severely injured. The greatest injury to the Wealthy is in the axils of the branches, the center wood being discolored, but not affecting the growth of the trees.

A considerable number of seedlings have given up the ghost, while others seem to be hardier than Fameuse, Haas and the Russets, and equal to the Wealthy and Wolf River.

Our experience so far is that aside from less than a dozen Russians, it would be safer to plant the Wealthy, Okabena, Patten's Greening and, perhaps, Wolf River and the most promising seedlings,

than the long list of Russians. Blight is very troublesome again this season.

Two year old trees of a dozen varieties of the Lightly seedlings stood the winter well, as have also a few varieties furnished us by Mr. Dartt, from the Owatonna station. We are confident that several of Dartt's seedlings, and also of those sent out by Peter M. Gideon, will prove of great value for furnishing an abundance of fruit for home use in localities where other varieties do not succeed, and the best of them ought to be put on trial without delay.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

All varieties of strawberries wintered well, are in fine condition and promise an abundant crop.

Red raspberries that were unprotected suffered severely, Cuthberts being nearly all killed to the ground; Turners not so bad; Loudons generally unhurt. Where protected, all kinds appear in fine condition; Shaffer and Columbian unprotected, are in good condition and will bear heavily, with favorable weather. Black raspberries, though all unprotected, have wintered well except the Gregg. Palmer and others show finely.

Blackberries unless laid down, were killed. Where protected they are well set with fruit. Briton, Snyder and Badger are the leading varieties.

Grapes, though later than usual, are now doing well.

Some of the Russian cherry trees are fruiting again, and some are killed. The Minnesota Ostheim is slightly hurt.

Currants promise a large crop. The wet weather has caused a large growth of foliage. Varieties: Red Dutch, Victoria and North Star.

Gooseberries show a strong tendency to mildew. The Pearl appears fine; also Columbus.

Some Russian pear trees appear unhurt. Other kinds, though leaved out, the wood is blackened.

Of apples, the Duchess, Wealthy, some Russians and the crabs appear well. Walbridge, Golden Russet and others that bore heavily last year are injured. A row of twelve, two years planted, received from Mr. Somerville, are sound. They include Gideon's No. 6, Anisim, etc. Twelve from J. B. Mitchell, Cresco, Iowa, including Red Warrior, Lawrence and Early Yellow, are sound. Three rows, twelve each of Wealthy seedlings, are all right. Very few apples are set, especially on trees that bore last year, but crab apples show very well.

PLUMS.—Trees that fruited heavily last year had nearly all abortive blossoms. All bloom has been retained longer than usual, whether owing to conditions of trees or to the weather I cannot say. After first bloom appeared, less time intervened than usual before full bloom. Pistils became receptive sooner than usual. All kinds bloomed very full but pollen was more scanty than I ever observed before. A day of high wind destroyed much pollen before pistils became receptive.

Northern varieties are unhurt; Chickasaws were mostly killed.

DATES OF BLOOMING, ETC.

[L. long pistil; S. short pistil; M. medium pistil.]

VARIETY.	First Bloom.	Full Bloom.	Blossom Fallen.
1—Seedling (Nigra group) L	May 2	May 4	May 8
2—Comfort (Iowa) L	" 2	" 4	" 7
3—Aitkin (Minn.) L	" 2	" 4	" 8
4—Brittlewood (Neb.) L	" 2	" 4	" 7
5—Risinger (Minn.) L	" 4	" 6	" 9
6—Hart's De Soto (Minn.) L	" 4	" 6	" 10
7—Rockford (Iowa) L	" 4	" 6	" 8
8—Cottrell (Minn.) L	" 5	" 7	" 10
9—Brittlewood No. 1 (Neb.) L	" 4	" 6	" 10
10—Wolf (Iowa) L	" 4	" 6	" 10
11—Hunt's Mirabella (Iowa) L	" 5	" 7	" 10
12—Compass, Hyb'd sand cherry (Minn) L	" 6	" 9	" 12
13—Miner (Ill.) M	" 6	" 8	" 11
14—Winnebago (Wis.) M	" 2	" 4	" 7
15—Ocheeda (Minn.) M	" 4	" 6	" 9
16—Cheney (Wis.) M	" 2	" 4	" 8
17—Gaylord (Iowa) M	" 2	" 4	" 8
18—Mankato (Minn.) M	" 2	" 4	" 7
19—Taylor (Minn.) M	" 2	" 4	" 6
20—Guilford (Nigra group) M	" 2	" 4	" 8
21—Weaver, M	" 4	" 6	" 9
22—Kopp (Minn.) M	" 2	" 4	" 8
23—Knudson's (Minn.) M	" 2	" 4	" 7
24—Homestead (Minn.) M	" 2	" 4	" 7
25—Surprise (Minn.) M	" 4	" 6	" 10
26—Rollinstone X Wolf (hand pollenized) M	" 4	" 6	" 8
27—Freestone—Cottrell seed—(Minn.) M	" 4	" 6	" 9
28—J. B. Rue (Iowa) M	" 4	" 6	" 9
29—Jap X De Soto M	" 4	" 6	" 8
30—Guilford No. 2 (Iowa) M	" 4	" 6	" 9
31—DeSoto Seedling M	" 4	" 6	" 10
32—Abercrombie (Minn.) M	" 4	" 6	" 8
33—Stoddard (Iowa) M	" 4	" 6	" 9
34—Weaver (Iowa) M	" 4	" 6	" 10
35—Gable (Iowa) S	" 4	" 6	" 10
36—New Ulm (Minn.) S	" 4	" 6	" 10
37—City (Minn.) S	" 3	" 5	" 8
38—Forewattamie (Neb.) S	" 4	" 6	" 10
39—Stooks' Minnesota S	" 5	" 7	" 11
40—Wyant (Iowa) S	" 6	" 8	" 11
41—De Soto (Wis.) S	" 5	" 7	" 11

Plums hurt in bud or winter killed:

German Prune; Hungarian; Richland; Veronesh Yellow; Stark's Gold; Blood's Golden; Abundance; Red June; Kreuger (from Denmark); Berger; Ogan; Decker; Wadsworth; Pottawattamie.

Some of these show leaves, but the wood is discolored.

MONTEVIDEO TRIAL STATION.

L. R. MOYER, SUPT.

The winter in western Minnesota was very severe, with scarcely any snowfall. Some snow fell in March, but it melted soon afterward and formed pools of water among the tree plantations. A sharp frost followed, and where the pools of water stood much damage was done to the trees, shrubs and even the grass.

THE FRUIT GARDEN.

PLUMS.—Among the plum trees, Cheney came through in good condition and is setting a good crop of plums, although some plum pocket has appeared. The Ocheeda plums are all dead. The Weaver is dead. The Stoddard is dead. New Ulm is in good condition but is setting no fruit. Biksby plum is looking well and setting fruit. Surprise plum is looking well but is not fruiting. The Hunt plum is dead. Forest Garden plum is much injured. Owatonna plum is looking well and setting a heavy crop of fruit. Harrison Peach plum was killed back but is starting vigorously. Rollingstone is thrifty and vigorous but too young to fruit. Ironclad plum is killed to the ground. De Soto plum is looking fine and fruiting. Alley plum is badly injured. The Wyant is killed on black prairie ground but is looking well on the hillside. Rockford plum is looking well and fruiting heavily. Knudson's Peach plum is in fine condition and fruiting heavily. The Wolf plum is fruiting and looking well. Marmika plum (Russian) is badly injured. Nineteen Orel and Twenty Orel are both badly injured.

APPLES.—No. 307 Iowa Agricultural College, one tree killed, the other looking well. Hibernal, all trees in excellent condition. Okabena, top-killed but starting vigorously from the root. Anisette, in perfect condition, not fruiting. No. 242 Iowa Agricultural College, looking fairly well but not fruiting. 4M, looking well, not fruiting. Greenwood crab, badly injured but setting fruit. Peerless, one tree injured and not fruiting, one tree looking well. Gideon 39, dead. Virginia, one tree looking well, one well established tree dead. Martha, dying. Whitney, all trees looking well, some fruiting. Sweet Russet, one tree injured, one looking well. Cinnamon Pine, top dead but starting vigorously from root. Pride of Minneapolis, looking well. Borovinka, dead. Patten's Greening, dead. Florence, dead. Transcendant, one tree winter-killed, others in good condition. No. 984 Iowa Agricultural College, looking well but not fruiting. Charlemoff, dead. Hyslop, uninjured, fruiting heavily, blighting. Volga Anis, looking well, not fruiting. Un-named tree from Mr. Brand, in fine condition. 22M, Blushed Calville, fine condition, not fruiting. Simbrisk No. 1, looking well, not fruiting, shows a little blight. Wealthy, uninjured, fruiting. No. 987 Iowa Agricultural College, good condition, not fruiting. Tonka, badly injured. Power's crab, looking well, fruiting. Gideon (Storrs & Harrison), looking well, fruiting. No. 332 Iowa Agricultural College, looking well but not fruiting.

CHERRIES.—Bessarabian cherry, several trees looking well, some trees injured. Wragg, one tree injured, one looking well. Suda Hardy, looking well. Ostheim, looking well.

PEARS.—Bessemianka No. 508, looking well, not fruiting. Kurskaya 392, good condition, not fruiting.

North Star currant is looking well but not fruiting heavily.

Raspberries well covered with earth are all right.

THE SHRUB BORDER.

All the bush honeysuckles came through in fine condition. The finest is Lonicera splendens, from Prof. Budd. Lonicera elegans is also very desirable. Lonicera Albertii was injured to some extent on level ground where water stood.

None of the caraganas suffered in the least, and all the different species and varieties were well covered by their bright yellow flowers.

Some of the philadelphuses were a little cut back by the winter, but they are all putting forth new growth and promise an abundance of bloom. 144 Voronesh, from Prof. Budd, seems to be one of the best.

The Russian almond, from Prof. Budd, appears to be as hardy as a bur oak, and gave this spring an abundance of bloom. It is setting some fruit. Almond raising may become a new industry in Minnesota.

Prunus Maackii came through unharmed and is one of our finest very early spring flowering shrubs. Prunus tomentosa was killed back to the ground but is starting from the roots.

The common barberry, as well as its purple variety, were badly injured on level ground, but are all right on dry, windy bluffs. Berberis amurensis was uninjured.

The nine-bark, Opulaster opulifolius, is in fine condition on bluff-sides, but on the more level lands it has received some injury. The golden-leaved variety suffered the most.

There was no injury to lilacs, but not quite so much bloom as usual. Syringa villosa has bloomed abundantly this spring, and proves to be three weeks later than the old varieties. It is quite distinct. Syringa josikea is also in bloom, showing dark blue flowers, and appears to be a valuable late lilac.

Tamarix amurensis suffered greatly and is killed back to the ground,

Licium vulgare killed back quite badly.

Spiraea hypericifolia was uninjured, but spiraea Van Houtii suffered somewhat.

Pyrus tortingo suffered some injury.

The Manchurian maples came through uninjured and are a great acquisition.

The Russian artemisia, distributed by Prof. Hanson, is proving to be a useful ornamental shrub on rather poor sandy land. It needs some pruning.

Elaeagnus angustifolia has again made a good record, but Elaeagnus argentea succumbed to the winter.

The thanks of this station are due to Prof. Hanson for a large supply of Eleagnus angustifolia and Caragana arborescens.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

The autumn of 1898 was rather warm and wet. We noticed some bloom on the Enhance strawberry early in October. There was abundance of moisture in the soil when it froze up.

We had a heavy snowstorm in November, which was drifted among my trees, in some places several feet deep, some of which did not melt away until late in April. We had several heavy snowstorms during the winter, but we also had several spells of weather that was so warm that there was but little snow on the ground during most of the winter except what lay in drifts. We had a long cold spell in February, the coldest being from 46° to 50° below zero.

APPLES.—I cannot see but that my fruit trees wintered as well as usual, some of them better. There was no killing back of apple trees. There was an occasional terminal bud killed on the Malinda, Scott's Winter, Daisy and Hotchkiss—as we have over one hundred varieties in our orchards, we think this is a pretty good showing. The apple crop will be very light here this season, no variety bearing anything to speak of, except a few trees of the Wealthy and Hibernal that I girdled the latter part of June of last year. The orchard is now making a remarkably vigorous growth. The variety that seems best adapted to our condition, all things considered, is the Soulard crab, and the variety that now seems the most worthless, outside the blighters, that I cut out as fast as I find them, is the Briar's Sweet crab. It grows a few inches in early season and then nearly dies each season of scab. Root-killing of young orchards where not well sheltered has been the rule in this section the past winter. I only lost two trees this way, one Whitney and one Hibernal, each set three years. On north and west slopes, trees root-killed the worst.

PLUMS.—A good many trees looked pretty sick this spring. I chopped out quite a number of large Rollingstones that were on their own roots. They have been very unprofitable, as they are troubled with borers worse than most varieties. I also cut out about twenty-five bearing trees of Wolf and De Soto that were root-killed. They had been grafted on the Marianna, and seem to root-kill with less cold than do apple trees grafted on French crab stock. The plum crop will be light this season. New Ulm, Odegaard and Aitkin now show up among the best. The Aitkin at this writing is much the largest. The New Ulm has proved one of the most reliable bearers and very large when full grown. Its greatest drawback is its drooping habit of tree. I also have great expectations for the Odegaard and Aitkin in exposed situations. In this section plum trees have root-killed the past winter quite as much as apple trees. The plum trees of commerce seem to be grafted on either Marianna or Myrobolan stocks. I have had difficulty and sometimes failed to get trees grafted on hardy (Americanus) stock for my own planting.

SMALL FRUITS.—Strawberries will be a heavy crop. We had a few ripe berries from old beds on June 13th. Bederwood and Warfield are mostly grown, the former rather soft and light colored for dis-

tant market, but seems to be just the berry for home use for those who want to grow only one variety. We shall discard the Enhance on account of its unattractive appearance in the box. My strawberry fields wintered perfectly, but I have reports from many about here that their strawberry patches all winter-killed.

Currants a light crop, no variety bearing as it should. Long Bunch Holland very healthy and vigorous.

Sand cherries two years from the seed are bearing freely. Dwarf Juneberry is bearing a heavy crop. This seems to be one of the fruits that is perfectly adapted to this section.

Cherries are not bearing anything to speak of. All varieties seem about alike; from forty to sixty per cent of the buds were killed by the cold winter, and those that blossomed were mostly destroyed by cold storms.

We have had a great amount of rain so far this season. I have examined this spring several orchards on the hills along the river, and while they are now bearing more freely than my prairie orchard, they also suffered more severely, even where well sheltered by trees, by the very cold weather of the past winter. I have set in experimental grounds the past spring the Compass cherry and Patten's No. 102 apple, from C. W. Sampson; Surprise plum, from O. M. Lord; a fine collection of shrubs and Rocky Mountain evergreens, from Prof. S. B. Green; plum and apple scions in variety from various sources. We have had no apple blight as yet this season.

THE MINNESOTA STATE FORESTRY BOARD, AND ITS FIRST MEETING.

Minnesota's new State Forestry Board held its first meeting in the capitol in St. Paul, Monday, June 26th, elected officers and appointed three committees. There was a full attendance, and the liveliest interest in the work that lies before the board was expressed by all the members. Assurances were given that in the near future gifts of forest lands aggregating hundreds of thousands of acres will be made to the board. The personel of the board is as follows:

Orville M. Lord, Minnesota City, Winona county.
John Cooper, St. Cloud.
Albert L. Cole, Walker.
Judson N. Cross, Minneapolis.
Greenleaf Clark, St. Paul.
C. C. Andrews, State Fire Warden.
Professor Samuel B. Green, State Agricultural College.
Frederick Weyerhauser, St. Paul.
Judge William Mitchell, Winona.

The forest law required the governor to make appointments on the recommendation of the regents of the university, the state forestry association, the horticultural society, the game and fish commission and the agricultural society, while the state fire warden, Gen. C. C. Andrews, and the professor of horticulture in the state agricultural college, Professor S. B. Green, were made *ex-officio* members of the board.

The regents were entitled to three nominations, and they chose Messrs. Lord, Cooper and Weyerhauser. The first is a well known nurseryman, the second is president of the state agricultural society, and Mr. Weyerhauser is the well-known lumber magnate. It is considered a hopeful sign both for forestry prospects in general in Minnesota, and for the work of the board in particular, that such a practical and extensive lumberman should consent to serve on a forestry board. Mr. Weyerhauser does not merely consent, but feels the keenest interest in the work of forest restoration and preservation. The horticultural society elected Mr. Duncan of Duluth, but he was unable to serve, and consequently Governor Lind appointed Mr. Cole to take his place. Judson N. Cross, the well-known Minneapolis attorney, is president of the state forestry association, and was nominated by that body. Greenleaf Clark of St. Paul requires no introduction; the agricultural society nominated him. The state fish and game commission nominated Judge Mitchell of the supreme court, who is an enthusiastic fisher and hunter.

The meeting organized by electing Captain Cross, president, Greenleaf Clark, vice-president, and General Andrews, secretary.

These officers are permanent, but a committee to perfect organization was named as follows: Messrs. Clark, Green and Cross.

A temporary executive committee was made up of the president, secretary and Professor Green. This committee is at once to arrange for a visit to and inspection of the Minnesota forests by Professor Schenck, forester of the famous Biltmore estate. It is hoped that the regents of the university will co-operate with the board in bringing Professor Schenck to Minnesota.

Messrs. Cooper, Cole and Lord were appointed a committee to solicit donations of forest lands as provided by the law.

Calendar for July.

O. M. LORD.

It was hoped that the intense cold of last winter would prove destructive to insect life and also to fungous diseases of fruit, but nearly all species are strongly in evidence, and fruit growing in this vicinity has received a severe set back with hail, intense cold, excessive wet, violent storms and hordes of insects. Such are the conditions some of us have to meet this year, and they all seem to come at once; and yet, the productive country is so large, and transportation so efficient, that the market is fairly supplied with vegetables and berries, with no great profit, at least to the small

grower. The only remedy that can be offered is in the line of cheaper production.

The strawberry season closes about July 1st. Unless there is a good home demand only those kinds should be kept which are good shippers. The very best are none too good in a wet season. Consult the catalogues for varieties of firmness, color and quality. All varieties, if productive, are good enough for family use. As soon as the berries are picked, mow the vines and, if not practicable to burn, rake clean and plow two or more furrows between the rows, and then level the ground with the harrow. Hand weeding, hoeing, etc., add materially to the cost and cannot be done profitably. In my experience, a proper preparation of the ground before planting is of more importance than manuring the mature plants.

Red raspberries closely follow strawberries. The cheaper method of producing them is first to secure varieties adapted to your soil, as they are full as variable as strawberries. Plant four feet apart in the rows, with rows at least eight feet apart. Use the cultivator as much as possible and avoid hand labor. Allow the canes to grow without clipping or pinching back. In the spring cut back one-third. Keep them in hills by cultivating both ways. Most varieties have need to be laid down for the winter. If not to be laid down do not thin out in the fall, as the snow will give more or less protection.

Black raspberries need a different treatment from the reds, as their habits of growth are different. The tops of the new shoots need clipping to make them branch when they have grown from one foot to eighteen inches. If cutting back is delayed too long, the canes are top-heavy and fall down. If properly cut back, they need no stakes nor wires to hold them up. For wintering, the same rules may be observed as for the reds.

Blackberries and grapes need little care this month except to keep them free from weeds. All young fruit trees need careful watching to prevent excessive growth of foliage or limbs upon one side, injuring the shape.

Trees and plants set this spring will need especial care if dry weather occurs, as the season has been so wet that there is now an unusual growth of foliage, which will then have to draw upon the roots for moisture, and unless the plants are well mulched, cultivated or shaded they will suffer much more than if there had been a moderate growth.

There has been up to this time an unusual fall of tree fruits, occasioned by excessive wood growth, which prevents the development of fruit. Though trees blossomed very full, and a large quantity of fruit set, the production will be light, especially of apples.

Secretary's Corner.

THE AMERICAN ASSOCIATION OF NURSERYMEN.—This society met in annual session in Chicago, Chicago Beach Hotel, June 14th.

ANNUAL MEETING OF THE OFFICERS OF EXPERIMENT STATIONS.—This is to be held in California in July. Prof. S. B. Green as secretary of one of the sub-organizations connected with this work is to spend that month in the west, going June 28th.

OUR REPRESENTATION ON THE MINNESOTA FOREST RESERVE BOARD.—For some reason not at present known to the writer, Mr. Chas. A. Duncan, of Detroit, who was chosen by the society at the summer meeting to represent it on the board was unable to serve, and the governor appointed Albert L. Cole, of Walker, Minn., to fill the vacancy so created. The board held its first meeting for organization at St. Paul Tuesday, June the 26th.

OUR SOCIETY IN TOUCH WITH EUROPEAN HORT. SOCIETIES.—Prof. W. M. Hays, the agriculturist of the State Experiment Station, and now for many years an active member of this society, is on his way to Europe for the summer vacation. He goes as an accredited delegate from this society to such similar associations as he may meet there. We shall expect an interesting report of his doings in this direction on his return in September.

A POMOLOGICAL SOCIETY IN CONNECTICUT.—Connecticut has not till recently had any organization recognizing horticultural interests, but some two years since a society under the above title was formed and has developed sufficient strength already to have secured a printing appropriation from the late legislature. Their first printed report covering its doings up to this time is now in press. H. C. C. Miles, Milford, Conn., is the present secretary.

MISSOURI FRUIT EXPERIMENT STATION VS. INSECTS AND DISEASES.—The last legislature of the state of Missouri has enacted a law to establish a fruit experiment station in the southern part of the state for the purpose of testing fruits and studying the insect and disease problems. The managers of the station also have the authority to look after diseased or insect infested trees, &c, throughout the state. They cannot, however, destroy infected trees without an order from the court, and then it is done at the expense of the station. A peculiar feature of the bill is the limiting of wages to be paid at the station, or in this outside work, to $1.50 per day. There is a board of six in control of the station at a salary of $300 each and expenses, and, besides, a manager and inspector at a salary of $2,000. There is no provision in this law for inspecting nursery stock shipped into or out of the state.

THE COMING FRUIT EXHIBIT AT THE STATE FAIR TO BE IN PLACE BEFORE FAIR OPENS.—This very important change in the preparation for the fair should have special notice. Our readers have all received the premium list, and they will find at the top of page 43, under the head of "Notice," this new regulation. Exhibitors will find it necessary to plan for this, and their hearty co-operation is expected in carrying out successfully this innovation. Monday morning will open up with the horticultural hall in a finished condition, fully ready for visitors. This is a "consummation devoutly to be wished" for, and for which we shall all labor heartily.

THE FLORIDA SOCIETY MEETS.—The horticultural society of this southeastern state convenes in the late spring, and this year met in twelfth annual session at Jacksonville, on May 2-5. The attendace was very large, 175, and in membership the organization ranks very high, reporting a total of paid members of 352. The misfortunes of the fruit growers of Florida have brought them together in force to study the vital problem of immunity from frost, which has been forced upon them. All kinds of schemes from a smudge to huge sheds are being tried with varying results. Stephen Powers, of Jacksonville, is at present secretary of this society.

COLD STORAGE FOR FRUIT FOR THE STATE FAIR.—Fruit for exhibition at the coming state fair (or the next annual meeting of this society, in December,) may be stored as heretofore, without expense to the shipper, with "The Produce Refrigerating Co.," 410 First Street North, Minneapolis. Shipping tags to be used for this purpose can be had on application to Sec'y Latham, at the society's office. Apples are not to be so plentiful this year as during some others, and we shall all the more need the assistance of all our friends in keeping up the credit of the society on these two occasions Plan to send what you have to storage as fast as it matures, and it will be delivered to you in good condition and without expense at the proper time and place.

THE WOMEN'S AUXILIARY AT THE STATE FAIR.—The following notice appears in the new premium list of the Minnesota State Fair:

"The State Federation of Woman's Clubs will maintain headquarters upon the grounds during the fair, which will be in charge of committees appointed by the federation. The rooms will be kept open for the use of women, whether members or not, and all are cordially invited to make the place headquarters while visiting the state fair. Women from different parts of the great northwest can make appointments to meet each other here, where they will find a comfortable resting place. The management expects to arrange special exercises daily during the week, at which topics of general interest will be introduced. All who are interested in any subject for the advancement of women's work are invited to attend and present the same."

As the Women's Auxiliary affiliates with this federation, its members will be especially welcome at these rooms.

THE HORTICULTURISTS DINE—VIEW OF WEST HALF OF ARMORY HALL, STATE AGRICULTURAL SCHOOL, AT SUMMER GATHERING OF THE STATE HORTICULTURAL SOCIETY. THE STRAWBERRY EXHIBITS SHOWN IN FRONTISPIECE IN JUNE NUMBER OCCUPIED PART OF EAST HALF OF THE HALL.

THE MINNESOTA HORTICULTURIST.

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PRESIDENT'S ANNUAL ADDRESS.

J. C. HAWKINS, AUSTIN.

(Southern Minnesota Horticultural Society.)

Fellow Members of the Southern Minnesota Horticultural Society:

Ladies and Gentlemen:—I am pleased to greet you at the close of another year's labor and present, as your presiding officer, a few thoughts bearing on the interests of our organization.

Each season brings its crop or lack of a crop of flowers and fruit. This we expect as a result of the dews and showers, the frost and sun, and all the favoring courses of nature. Each year, also, at the end of his term of service, it is expected that your president will afford some sort of a crop of suggestions, denominated an address, in return for the honor of standing and pleasure of standing at the head of an honorable organization.

It is taken quite as a matter of course that the yearly crop of flowers and fruit will reflect the conditi on, favorable or unfavorable, of the season. If the crop be poor quality only, we can sort out and save the best, but if it be also very scanty in quantity it may be a real misfortune. If the president's address is of poor quality, we never complain of its shortness. The less in quantity, the better we are pleased.

For reference to the past and present conditions of our society, we are fortunate in the fact that we have an efficient secretary from whom we may expect items in detail, leaving the writer to generalize and submit a few suggestions, possibly worthy of attention and effort.

One great need of our country is more fruit. One of the best recommendations of a country is to say that it is fairly good in fruit production, that fruit is grown both for home use and market. In many sections orchards of greater or less extent have been planted,

and where conducted with a reasonable degree of care and intelligence have been gratifying and renumerative to their owners. Every farm should have an orchard and a grove of forest trees, and we farmers should make an effort to raise fruit trees if for no other purpose than to beautify our homes and make them more attractive to our families and the neighborhood.

The future apple and plum crop will be a profitable one, as orchard growing has not kept pace with the growth of population. The practice of fruit eating is increasing, as is evidenced by the report that we pay out to foreign countries nearly twenty million dollars in gold annually for bananas alone.

There are many interesting experiments for the progressive fruit raiser, opportunities for studying, investigating and digging for advanced methods and ideas. Then let us look to the bright side of horticulture, let us raise a greater variety of fruits and pay less gold to foreign countries for rusty prunes and sandy currants.

The king of fruits, the apple, can be raised on every farm in southern Minnesota. The improvement and cultivation of fruit should engage the attention of the farmer. It is his duty to make himself acquainted with the laws of plant growth and to prevent disease and the ravages of insects so far as his opportunity will permit, so that he may apply the knowledge within his grasp to his own pecuniary benefit and get a more exalted view of the real dignity of the calling which he is pursuing.

The field of the fruit grower is large, comprising in its area the orchards, vineyard, small fruits, shrubs and plants. It is full of variety and presents a multitude of objects and lessons calculated to call forth lofty ideas and sentiments and profound reverence for the great Architect who controls all.

While the entire population of the state is more or less interested in horticulture, the combined membership of the state and auxiliary societies is less than one to several thousand. These societies being the only representatives of an industry that beneficially affects all our people, not only financially but mentally, morally, and physically, it is our duty to consider means for extending their scope and usefulness, with the hope of securing larger attendance and increased enrollment. It is an obvious fact that time yearly gathers its quota from our midst. To fill these gaps in the ranks of horticultural volunteers, we must, of necessity, enlist the interest of others.

Past experiences suggest that the problem how to secure the attention of those whom we are desirous of sharing in our deliberations is not easy of solution. However, I suggest that we endeavor to attract the attentions of the young.

This, I believe, may be effected by encouraging the youth of both sexes to prepare essays on horticultural subjects, to be read at our state and auxiliary meetings, as a stimulus to awaken an interest in them in matters pertaining to horticulture, which, if successful, would result in a crop of amateurs that would lead to a more general and permanent interest throughout the state.

As a further incentive I suggest that premiums be offered for exhibits in the way of flowers and fruits, the competitors to be under twenty-one years of age. I believe the society can consistently and

wisely expend money in this direction and abandon our former custom of offering premiums largely monopolized by skilled exhibitors. I believe the time spent in spirited discussions over the qualities of the Duchess and Wealthy, the merits of which have long been determined, may be more profitably devoted to the interests of the young horticulturists.

Much is being done for the boys who are to fill the positions in agriculture, and perform the future work of farming. They are being taught what to do and how to do it; more than that, they are learning the principles upon which the science of agriculture and husbandry are based, so that while doing the right thing they will go on studying the book of nature and adding to the general stock of knowledge.

To some extent and in the same manner, the work of educating girls has been taken up in the agricultural and mechanical schools of the country, and teaching the arts of the home is accomplished by the instructions in the sciences relating thereto. The teachers of domestic science are not content to follow a dull routine of household drudgery in their teachings. They are appealing to the scientists and specialists in lines which touch the home life to explain the principles on which home practices should rest, and to show them how intelligence, taste and skill can make the home a pleasant place to live in, and how scientific knowledge can enable the home-seekers to maintain the health and generally promote the physical well being of those committed to their charge. In our branch of agriculture we may well invite, encourage and instruct young ladies to participate more generally along all lines of horticulture, resulting at least in a higher degree of home adornment. Let us therefore resort to some more practical methods for infusing new blood into our society.

For several years the question of horticulture in the schools has been discussed pro and con, but largely pro with an "if" or a "but"; the "if" is generally a long one, and the "but" a very stubborn one. It has been insisted that horticulture is of so much practical value and importance that it should be added to our course of study in the common schools, if we had teachers trained to teach the subject. But we should then fail for want of a text book suitable to the capacity of the common pupil.

It may be that horticulturists, like poets, are born, not trained; or it may be that the science of horticulture is like the science of war, the science not at all like the art itself in practice; one may be theory and dress parade, the other down-right hard work; one red tape and the gaudy paraphernalia of pomp and splendor, with glory to him who fighting dies, and fame to him who dares and survives.

The first old teachers in ancient Greece and Rome had no text books. The first horticulturists never saw a book on plant life or on any subject embraced in the science or practice of horticulture except the book of nature. Yet the subject, the art of horticulture is an old one, older than any tradition of civilized man. Away back in Noah's time, long before high license or low license was dreamed of, Noah planted a vineyard and made wine, and in the exercise of personal liberty was found in a state of intoxication. He was un-

trained in science, but practically he was a ship carpenter, zoologist, horticulturist and a preacher of righteousness, all without a text-book. At our last state meeting it was suggested to our legislative committee to call the attention of the legislature to the importance of changing the law in regard to the distribution of the state horticultural reports so as to put them into every common school district in the state that has a library. I am heartily in favor of that suggestion.

During the year I have made inquiries asking if the state horticultural society or this society had given authority to any tree agents to represent the stock they were selling as being recommended by these societies. Complaints have also come to my notice of orchards coming into fruitage, bearing entirely different varieties of apples from what the purchaser bargained for. This is only a repetition of the old story, but it suggests that continued efforts should be made on the part of the society to suppress this evil and to protect us from infected nursery stock, San Jose scale and other insects, as far as deemed practical.

Horticulture from mythical Eden to the present time has its history. Ancient horticulture as compared with modern was crude as was their civilization, but centuries have moulded the pursuits of life, horticulture has merged from its primitive state to more practical conditions and a scientific basis. The unity of the practical with the scientific is what makes the finished product in every art. We glean from the pages of the past that in all times horticulture has been the favorite pursuit of the more advanced races and of the foremost men. "God Almighty first planted a garden," and indeed it is the purest of all human pleasures.

History is replete with examples from the time of Cincinnatus the Roman who left his plow for the dictatorship of his country, and Maximilian, the emperor, who voluntarily gave up his throne to care for his cabbage patch. So, later, you have all read how, when the prince of English patriots, the philanthropist and statesman, William E. Gladstone, became weary with the herculean tasks of parliament he retired to the garden and forests of his lovely Haywarden, to engage in manual labor to recruit his overtaxed powers, and, like Athens of old, recover his strength by contact with mother earth. The greatest master of the English language has said that "Mercy is twice blessed, but horticulture brings a four-fold blessing, at least for him who engages in it; it brings health to the body, rest to the weary mind, and inspiration to the soul, while its reflex action blesses its neighbors."

Emerson says: "It seems as if the day was not wholly profane in which we had given heed to some natural object. He who knows the most, he who knows what sweets and virtues are in the ground, the waters, the plants, the heavens, and how to come to these enchantments, is the rich and royal man."

We may well conclude with Olf Gerard's enthusiastic charge: "Forward! in the name of God. Graft, set, plant and nourish fruit trees in every corner of your grounds, and God shall reward your mind and diligence."

THE COMMERCIAL APPLE ORCHARD.

D. K. MICHENER, ETNA.

(Southern Minnesota Horticultural Society.)

This is a problem we have been trying to solve for the past forty years, and I see veterans here who could tell you more in five minutes than I could if you would give me the entire morning session. It occurs to me that even their wise heads have been puzzled a little at times on this problem. I remember well in the spring of 1858, when father got on the old horse and rode ten miles after the first twenty apple trees, and when he came home we children in youthful anticipation could almost see the budding, blossoming and ripening fruit, for we had lived in this sparsely settled territory for more than a year without even smelling an apple. And this (displaying an apple) is all there is left of that first planting. The old tree died in 1885, and this apple grew on a shoot from the root. From that small beginning we kept building until the past season we had three thousand bushels of apples, and still we are all working on the old problem, "The Commercial Apple Orchard" for Minnesota. I remember, some twenty years ago, when Geo. Bar, a neighbor, was selling hundreds of bushels of Haas, Ben Davis, Fameuse, St. Lawrence and Duchess, at prices that would make us smile at the present time, I thought the problem solved, and that I would try those varieties. But, alas! mine went the way of friend Bar's orchard. He had some Duchess in his orchard, and he has them yet.

I commenced planting Duchess when they were first introduced and kept steadily at it; then when friend Jewell said "Young man, you ought to plant some Wealthy trees; it would be a good investment," I planted them and have never been sorry.

But by far the most profitable apple for me up to the present time is the (Now don't all speak at once!) Duchess. I commenced selling them in the early seventy's at two dollars and forty cents per bushel, and the past season at (Whisper it softly!) twenty-five cents per bushel, but in all that time they have averaged me fully one dollar per bushel. But to plant largely of Duchess now would be a mistake, but they are so easily and cheaply raised that an orchard should have a good supply of them. We have an abundance of fall and early winter varieties. What we need is a variety combining quality, hardiness of tree and long keeping. As far as keeping qualities are concerned, the Malinda fills the vacancy perfectly.

I am not going to mention the numerous varieties of new apples looking for a place in our orchards, for you will find people on every hand with their little horns ready to blow for the particular apple they are interested in. But my experience in the *apple business* in Minnesota has taught me that the Arctic blizzards have done the most effective blowing. I think it best to confine ourselves to a few varieties like Tetofsky, Duchess and Wealthy—though the Wealthy is not quite up to the standard of hardiness for fall and early winter varieties—I do not think you will find any better market apples in their season, for if they are cheap anything else would be. You

see by this time that it is hard for me to give up old frends. Now, if there is one among you that will stand up and demonstrate to you that he has found the ideal long keeping winter apple, let him be honored among men!

To sum up the whole question, "The Commercial Apple Orchard for Minnesota" is still experimental. A person may be very successful with some variety for a while and make his neighbors envious by his success, then wake up some fine spring morning with a big job of brush burning on his hands. While he was enjoying himself spending his apple money in Florida, one of those blizzards had cornered his apple trees. For all I have perhaps marketed more apples of my own raising than any one in this county, I cannot give you any good businesslike advice about planting a commercial apple orchard in Minnesota.

METHODS OF CANNING APPLES AND PLUMS.

MRS. S. F. LEONARD, WASHINGTON.

(Southern Minnesota Horticultural Society.)

Fruit, especially apples, has been a popular diet ever since the time of Adam. But as our climate does not permit us to have access to fresh fruit at all seasons, the happy suggestion of canning it has been made, and surely no dessert can be more healthful or palatable.

In canning apples, I prefer the Duchess and not over ripe. Great care is required in cooking, or they will become mushy. I use two kettles in canning, always using granite or aluminum. Peel, quarter and throw into cold water to prevent them turning dark.

For canning in the two-quart cans, I take two cups of sugar, two cups of water and two quarts of apples, putting a cup of sugar and one of water in each kettle. Let come to a boil and gently cook a quart of apples in each kettle. When tender but not mushy, skim out and put into the jar, which shall have been previously cleansed, scalded and, while still warm, rolled in boiling water.

The jar should be standing in a little hot water, while being filled. Pour in the syrup and carefully insert the handle of a table spoon next to the can, to let out the air. Seal tightly and turn upside down. This is to see if the juice escapes; in which case the jar is not air tight and must be fastened more securely.

In canning plums, care should be taken to select fresh fruit and not overly ripe. Scald the plums in saleratus water to make the skin tender and take out some of the sourness. Very little saleratus—a small teaspoonful to about ten quarts of plums is sufficient. Drain, and cook one and one-half quarts at a time, in a syrup made of three cups sugar to one pint of water. This is sufficient for a two quart can. When tender, pour carefully into Mason's fruit jars and serve same as apples.

A good way to open cans without destroying the rubber is to turn the can upside down in hot water for a few moments.

WHAT HORTICULTURE WILL DO FOR THE MINNESOTA FARMER.

W. W. PENDERGAST, HUTCHINSON.

(An address before the Minnesota State Agricultural Society.)

At the beginning of this century and for many years thereafter, all that was deemed necessary to carry on the agriculture of what time is proving to be the best and most resourceful state in the Union was a stone, a stick, a shell and a squaw. The stone was chipped into an ax, by means of which a stick and a turtle shell bloomed forth as a plow or a hoe, while the squaw furnished the muscular energy which was the sole motive power. With such an outfit, the Indian managed to provide, to a very limited extent, against starvation, when the exigencies of the chase threatened it. This was agriculture in its lowest estate. I use the term agriculture advisedly, because farming pre-supposes a farm, upon which is the home, with its more or less pleasant surroundings and systematic arrangement of buildings, yards, pastures, hay land, tillage and water; while agriculture (derived from ager, a field and colere, to cultivate) simply means the cultivation of a piece of land, no matter how rude the method or the implements. Where, a few decades ago, each returning spring saw the vast, fertile prairies to the west of us looking as though they had been swept by the besom of destruction, solitary as Crusoe's island and forbidding as the grave, it now sees comfortable homes and the promise of abundant harvests, which mark the civilization of today. It beholds crowded marts of business, great highways of commerce, magnificent facilities of transportation, constantly increasing conveniences of life and the grand system of education, which lies at the foundation of all. But great as has been the change in the recent past, there are still vast opportunities for improvement.

In every portion of the state we find that the income from our farms bears no just proportion to the labor expended and the expense incurred. There is waste in our work, waste in machinery, waste in our harvests, waste in feeding, waste in marketing, immense losses in bad plans or lack of plans, and still further losses from failure to carry out properly the plans that are made. This society, the State Horticultural Society, the Dairymen's Association, the common schools, and the school and college of agriculture, must work together to redeem the losses, to stop the leaks and to make the most of the magnificent agricultural recourses of this grand state.

The plant to which we must look for healing is no exotic; it cannot be brought from afar; it must be found at home, for it is "to the manor born." The ignorance of the best and most systematic ways of conducting farm operations on the part of the many, the careless, slipshod ways of others, the lack of interest in and love for the farm which characterizes a large class, who look upon it all as a drudgery which they would gladly escape if a way were open—all

these factors, taken together, constitute the heaviest burden that the foremost industry of the commonwealth has to bear. That all these untoward circumstances exist is due to the fact that our tillers of the soil have not understood how to apply the best methods to the conditions by which they find themselves surrounded. There is now, however, a general awakening going on—a realization that something is wrong which must be righted before the highest success is secured—which augurs well for the future. Indeed, the first forward step has been already taken. The procession is forming. The farmers are forming in line. Put your ear to the ground and listen! Do you not hear the advancing tread of the stalwart hosts that are to make the waste places fruitful and transform the wilderness into a garden? We see, with clearer vision than ever before, that lack of knowledge of these things concerning which we should be best informed is a most expensive luxury and have resolved to part company with it. It has held us in chains too long, and now "emancipation" is the rallying cry. We are emerging from the chrysalis state and are begining to see that the world has something for us to do other than to follow in the ruts of the Red River carts and to slavishly imitate methods that answered better in the early days, when it was only necessary to tickle the earth with a harrow and then lean against the fence to see it laugh with the harvest. They will not do today, when the fiercest competition ever known has made it clear that useful knowledge and practical intelligence are at the fore, capturing all the best prizes and securing the best results with the fewest failures and the least waste of energy. Opie, the celebrated English painter, when asked how he mixed his paints so skillfully, answered, "with brains, sir." He might have been more specific, though, perhaps, at the expense of terseness, had he said "with cultivated brains." That is the way the best farmers are winning now. Cultivated brains and expert knowledge are making a quarter section produce more than a section would yield under the management practiced in territorial days.

"The world moves." Turn which ever way we will, we see intelligence increasing our products, stopping the leaks, enhancing the profits, touching and brightening our homes, bringing comforts to our families and light and sweetness to our lives. The possibilities of forest and prairie will in the future be limited only by intellectual, moral and physical attainments. There is every reason to believe that an era of more rapid advancement than was ever dreamed of in the past is opening upon us. Our energies are beginning to be expended upon the lines of broad, practical utility, rather than those of narrow selfishness and questionable amusements. Every forward step made by one farmer helps everybody else, be he farmer, merchant or mechanic. We are being baptized with a spirit of philanthropy, and, pessimists to the contrary, this baptism is having its effect upon our social life and is permeating the whole body politic. The prosperity and advancement of the farmers, and a constantly increasing value of farm products in comparison with the expenses, means general prosperity and good times for us all.

The ideal farm is one where every acre is taxed to its utmost capacity and made to yield the greatest quantity and the finest quality of the particular crop to which it is best adapted, and which shows the greatest net gain—after the land is put into as good condition as it was in at the beginning of the year. But this is not all. There must be a charming and attractive home, protected by the most desirable trees from the winter's storm and summer's heat. It must have its orchard, its small fruits, its vegetable and its flower garden, its lawns and hedgerows, its singing birds, its running stream, its cozy nooks and shady walks, and comfortable shelter for the animals used upon it. No one has ever had everything to his taste. Perfection has never been attained. If one could, by any possibility reach it, there would be nothing left to live and hope for, except to be of benefit to others not situated like himself—but with them he would necessarily be out of sympathy, and the baptism before spoken of could not bring him into that close communion essential to a thorough enjoyment of the work.

Horticulture and agriculture should march together, hand in hand, as neither is complete by itself, and each furnishes what the other lacks. The one aims, after driving the wolf from the door, to increase the material wealth of the individual and, incidentally, of the state; the other cultivates the moral and aesthetic faculties; it sees in the various vegetables, plants, shrubs, fruits and flowers, with which it artistically surrounds the home, something more than the hard cash which the annual products will bring when exposed for sale in the public market. The necessities of life being provided for, the true horticulturist sees more of real value in the beauty, the poetry, the sweetness, the unalloyed pleasure springing up around him in answer to the touch of his hand and the execution of his well laid plans, than in a bonanza farm with forty hired men, a score of teams, a train load of wheat and all the concomitant hurry, bustle, confusion, doubt, anxiety and wear and tear of conscience, which cannot be escaped. The farmer who works for profit alone, and reckons that profit in dollars and cents exclusively, may be independent as the czar, but that very independence, coupled with his hard enviroments, tends to develop hardness, asperity and rudeness in his character. Though in the midst of nature, her charms pass unnoticed. Contemplating a beautiful tree, he sees only the spindling corn beneath its shadow and a cord of wood in its trunk and branches; so the ax is laid to its root, and the next year's crop is larger, the kitchen fire is warmer, and the heart of the farmer is colder and more callous. His bank credit is five dollars higher, his culture and refinement appear five degrees lower, and his farm is worth $25.00 less to the average buyer. To the man whose energies are directed solely toward securing as large an annual money income as circumstances will permit, culture is naught, beauty is naught, the milk of human kindness is naught, the love of nature is naught.

"A primrose by the river's brim
A yellow primrose is to him,
And it is nothing more."

The desire of creature comfort is common to both classes of soil cultivators. That gratified, one class looks for more acres, more wheat, more horses, more corn, more hogs—or, rather, he looks through all these, as spectacles, and sees more money. The other sees more beauty, more artistic skill, and has a higher appreciation of the things which delight the eye, gratify the taste, exalt the mind and touch the soul. The ultimate aim of each is happiness. Which is following the right road? It cannot be domatically asserted that either is wholly right. The two objects in view generally overlap and intermingle, and that is right. There are very few farmers who do not take some pains to have at least one beauty spot on their premises, which they enjoy and try to make more attractive every year, and who do not hope to be able in the future to devote more time to such features; on the other hand, no horticulturist would refuse to hold out his hand to catch an odd dollar that might fall to him by the way of profit or in payment of his work—indeed, that is a part of his plan. Let him learn from the farmer to plan still more and work more for the universal medium of exchange, whereby he can obtain some good outside of his own little, self-imposed limitations; let the farmer learn that there are many springs of pleasure that do not break out from the barren rock at the waving of a golden wand. They must come, if they come at all, in response to the working of his own fertile brain and his own well-planned and well-directed efforts to better his enviroments and to elevate himself and his family to a higher plane of life.

The man who is carrying on a quarter section, noticing a well kept garden, with its corn a foot high, rank and luxuriant, on the 15th of June, while his yellow and sickly corn is only high enough to mark the rows, and, three months later, seeing that garden patch yield a crop of seventy-five bushels per acre, while he has nothing but nubbins, must begin to comprehend the fact that there is something wrong about his tillage, and, if wise, will profit by the hint that his neighbor silently throws out.

The gardener seeing the economy of long rows and machine work, will leave the little oblong patches and raised beds to his more antiquated brethren across the water.

So, while the vocations will always be distinct, the followers of each must be continually gaining new ideas from the other and putting them into successful practice, advancing toward a higher culture, a nobler life and grander civilization.

GETTING RID OF ANTS.—Make holes with a crowbar or convenient stick, from six inches to one foot deep and about fifteen inches apart, over the hill or portion of the lawn infested by the ants and into each hole pour two or three teaspoonfuls of bisulphide of carbon, stamping the dirt into the hole as soon as the liquid is poured into it. The bisulphide of carbon at once vaporizes and, permeating the ground, destroys the ants but does not injury the grass. One should remember while using this substance that it is highly inflammable and should not bring near it a flame or even a lighted cigar.—*Massachusetts Experiment Station.*

DIFFICULTIES IN PRODUCING A WINTER APPLE.

F. W. KIMBALL, AUSTIN.
(Southern Minnesota Horticultural Society.)

I am asked to name some of the difficulties in producing a winter apple. I wish I could readily name the possibilities and could put men in the way of producing them, as in time they will be produced in this climate in abundance and in variety enough to suit any fair minded individual, I have not the least doubt. But what of the process? The advent of the Russian apple has been of the utmost value to us, bringing to our door without loss of time, and almost without cost, the results of decades of time and, perhaps, in the aggregate, of hundreds of thousands of dollars in money spent in experimenting on fruits, trying to adapt them to a climate quite similar to our own. In this work have been engaged many matured minds of people as intensely interested as are the few gathered here today to study and discuss all new methods of bringing to the front, that all may partake of the results, that much sought winter apple, that shall be the king of all apples in that the tree shall be hardy, fruitful, and the apple the most palatable, and with fair care, be able to resist decay till near the time when the early apple shall again make us glad.

It would seem that the late keeper is of slow development on the tree, and that in consequence it saps the vitality to such an extent that the tree has not opportunity to store up nourishment to withstand a hard winter, in case one comes on the heels of an abundant crop. We are now beginning to find a few varieties of the Russians that are safely designated winter apples, that so far as we have been able to discover are among the most hardy. But the claim is made by many that none of the Russians possess quality. To some extent that may be true, but give us hardiness and late keeping, and if we cannot breed in quality then we are not the enthusiasts I believe we are.

For us old, grey headed fellows, the refuge of top-working comes in. I fully believe that many choice winter apples can be raised in that way, but it is too long a road for one not an enthusiast, and the apples must be produced for the thousands, not the few, and they must be produced as readily as we now raise the Duchess. Then, and not till then, will the farmer's boy and girl be able to eat the health giving apple to their hearts content the whole winter long. How is that coming? I firmly believe through seed production, and, probably, that seed from the Russian apple, the flower having been hand fertilized with the pollen of some of our best and choicest American varieties. It may be that today the millenium is nearer at hand than we dream. With the systematic cross-fertilization that has been going on in our agricultural schools and among enthusiastic and persistent horticulturists we may now have them at our very door, and in abundance, though the chances are that it will be an evolution and take several generations to work out. As you cannot raise up a high type of horse or cattle through one cross, it is not at all probable that you can develop an apple containing all the good qualities by one cross; it has got to come by intelligent and persistent work, but we have those among us who

certainly will work it out. I firmly believe that a great part of the weakness of our trees comes from their root system, accentuated by winter droughts, and think this a most desirable field of investigation, as I think each variety has as marked a root system as it has of top. Now, for a good hard winter to relieve us of this octopus of hundreds of new seedling varieties thrust on our notice with the endorsement that they are doing well and have stood our winters for the past ten to fifteen years, perhaps even longer, and, consequently, are hardy; while the possibilities are that less than a baker's dozen could, after bearing freely, stand such a winter as 1872-73 or 1884-85. While such a winter could bring wailing and lamentation in depriving us of our pets and destroying fond hopes built up, yet what a benefit it would be in the end in revealing to us those few varieties there are that we can safely plant.

The Russians will help to give to us a tree that ripens its wood early in the fall and goes to sleep and is not in haste to awaken in the spring to develop its buds and blossoms to catch the rude blasts of the spring which not infrequently confront us.

It will probably be an apple that is not a large bearer, but a light and annual bearer, and we must learn to assist nature all we can in supplying food that can readily and quickly be assimilated, both in developing the fruit and the stored reserve necessary to help the tree to withstand the rigors of a hard winter, should it at any time come. This science will give, and through the improved methods will come the fruit that will surprise the old and encourage the heart of the young horticulturist.

MIDSUMMER REPORT, 1899, SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

The worms came three times last summer, and the last time the leaves did not grow again on the trees. Last winter we had no snow, and only about fifty trees started to leaf out. Most of those have since died. I suppose what trees the worms did not finish were so weakened that they could not withstand the great depth of frost in the ground. As I knew it was an accident of worms and not of climate, I had a piece of ground with a northern exposure ploughed up and put in order, and sent to three nurserymen who belong to the horticultural society and received one hundred and fifty trees, four year old. Some were plums, but most of them apple trees. They all sent me more than I had reason to expect for the amount sent them.

Then I received a bundle of plum trees, also some small fruit shrubs, etc., from Prof. Green. At the present time they are all alive and doing beautifully. Strawberries have done well, but currants, gooseberries and raspberries are but half a crop, owing I think to the worms eating the leaves last year and thereby weakening the plants.

Our flowers this year are gorgeous, the many rains helping their growth and bloom. In fact, all trees, plants and vegetables are in such fine condition that all of us out in this part of the state feel very hopeful.

BERRY CULTURE FROM EXPERIENCE.

E. F. PECK, AUSTIN.

(Southern Minnesota Horticultural Society.)

In presenting this article for your consideration, I make no apology for going into details, for the beginner can not possibly know too much about his new enterprise, and the old grower eagerly grasps everything relating to his specialty in the hope of gaining fresh and, perhaps, valuable information. He wants to know how the other fellow manages. The "*know how*" makes the difference between success and failure in any enterprise, and no one knows this better than the man who goes into the culture of small fruit for all there is in it.

STRAWBERRIES.—In taking up the subject of *strawberries* I will, in as small a space as possible, give my method of raising this best of all small fruits. I say best of all, and I say it advisedly, for a better man than I, and a wiser one, has said: "When God made the garden of Eden he decorated it with the best of all small fruits, the strawberry, and man and his helpmeet have improved and cultivated it from then until the present time."

I shall not in this article give my opinion in regard to what may seem the one essential, the particular qualification of soil necessary to the production of a large crop of strawberries, for the reason that I do not wish to discourage any one from making a start whose inclination may lead in that direction. I am sure that there is no soil upon which a good crop of corn or potatoes can be raised, where some variety of strawberry will not do equally well. I will go still further and say that, in my opinion, the kind of soil has no more to do with success on the farm or in the garden than the kind of man that manipulates the soil. Any land that is worth paying taxes on, with the proper amount of brain and muscle judiciously mixed will produce paying crops of strawberries, provided always climatic conditions are favorable. If you are not the right kind of a man, thoroughly in love with your work and bound to do your whole part in assisting nature, as the Irishman said, "The best time to quit is just before you commence."

If it should happen that a kind Providence has placed you in possession of a location and soil well adapted to the particular variety you choose to plant, with scarcely any effort or exertion or expense on your part good results may come to you the first year. But my friend, let me tell you that after this experience you will have to take off your coat and go to work, or nature will see to it that it don't occur again on the same piece of ground.

Now, then, while too much stress cannot be laid on the early setting of *strong, vigorous, well-rooted plants* and their subsequent cultivation, I must say right here that the profits of a strawberry plantation will be very largely governed by the thorough preparation of the soil previous to planting.

After selecting a location, if possible, above the frost line, fitting the ground with me is done as follows: Spread manure in the fall, winter and early spring on ground that has been fall plowed; surface plow not more than four inches deep; harrow to pulverize remaining

lumps; plow deeper, disk harrow, fine harrow and roll. The ground is now ready for the plants. One plant set in April is worth ten set in May and twenty-five set in August, generally speaking, for a permanent bed. If I use both staminate and pistillate varieties I set alternately one row of the former to two of the latter; rows three feet apart and plants two feet apart in the row. I never go to an old bed for plants. Cultivate immediately after setting and after every rain, before ground becomes encrusted, conserving moisture by preventing evaporation. Should the season be dry and showers infrequent, cultivate once a week very shallow and not too close to plants. Keep off all runners the first season except for a few plants to reinforce should they be needed. The cost of cultivating is the same whether there is a good stand or a poor one, while a good stand makes a difference in the yield and lessens the cost of production. Mulch as soon as ground freezes, preferably before snow comes, with marsh hay, just enough to cover the ground and plants nicely, which is mostly needed around the hills the next season to keep berries clean and hold moisture in the ground.

Right here is a point that admits of no argument. This year's crop of strawberries will depend very largely upon the way the plantation was managed last season. There is'nt much you can do except anticipate, and in the over fifty years that I have been permitted to exist, I believe that anticipation has brought me just as much real enjoyment as realization itself. I have now for each plant that was set last spring, a strong, healthy, deep-rooted hill, that has been able to resist disease of all kinds by having had such culture as has made its growth continuous, with from one-half a dozen to a score of crowns, which will have from one to three and even more fruit stems. This means to me, with my faculty for anticipating, one quart of prize berries with a possibility of more than double that quantity.

If, for reasons beyond my control, I should get no fruit at all, I am far better situated than my neighbor across the way with his matted row system, for I can continue during the season building up my plantation by frequent cultivation, thereby adding fertility to the soil, for tillage *is* manure, with the best of prospects for an enormous yield next season. While he must abandon his plantation, which puts him two years behind, for with all the labor that he can bestow in trying to renew it he must meet with poor success.

Don't understand me that I am in favor of the hill system first, last and all the time, for I am not. But I am *decidedly* in favor of keeping my plantation in hills until it produces one crop, after which I can deviate according to my best judgment.

RASPBERRIES.—In this article I will show no partiality between the reds and the caps, for I consider them of equal value. For while the red varieties may be more productive, the cap is more easily managed, can be picked cheaper and stand up better in the boxes while on the market.

While the two species are propagated by quite different methods, with me the after culture and care is practically the same. What I have said about preparation of soil previous to setting the plants

for strawberries, will apply here as well. I have no choice between fall and spring setting of plants, having practiced both quite extensively with equal success.

In starting a plantation of new varieties I have to take what I can get, but I would not, if I knew it, deal with a man that would take my money and give me plants from a plantation which he had planted the year before. Perhaps there are none such. Horticulturists, as a rule, are inclined to be honest, which may account for so many of them being prohibitionists.

I practice starting in a small way and as soon as possible grow a block of plants from which to obtain stock to my liking, for I am positive that good crops of fruit and good plants for setting a plantation, which you intend shall endure and be a source of profit for a term of years, *cannot* be grown from the same root the same season.

While the "continuous row" system has its advocates, my experience has found not a single thing in its favor, and I most emphatically favor the hill system.

I set plants, two in a hill, in rows both ways, four feet by seven. This method allows a larger percentage of cultivation to be done by horse power than any other method, and most certainly facilitates the labor of laying down for winter. Cultivate both ways with a fine tooth cultivator, and with a hoe or garden rake loosen the soil around the plants. There is, in fact, no road to clean culture of small fruit without a great deal of hand hoeing and weeding sooner or later. I leave only enough suckers for the fruiting canes the next season and treat all others as weeds. Cut them off just below the surface. I make it a point to have all other work well in hand, so that I can drop everything when there is an indication of a final freeze-up, and lay the bushes down and cover them completely with earth except the tips, which subsequent treatment shows will need no protection.

The next spring as soon as frost is out of the ground—although I have left them all till the middle of May—I carefully lift the bushes and cut back from one-third to one-half the past season's growth (this applies more particularly to bushes two years old or more), removing all weak canes and broken branches. Tie each hill loosely to a stake set firmly in the ground about three and one-half feet high. I cultivate as soon as condition of soil will admit, leveling and thoroughly pulverizing the soil over the whole surface, using the hoe or rake as before. The raspberry will stand more abuse than anything I know of and will also more readily respond to good treatment.

I started into small fruit culture some years ago, having for my motto, "What is worth doing at all, is worth my best effort," and have always been well repaid for thorough culture, especially of the raspberry. Frequent cultivation means a conservation of moisture, so necessary to tide the plants over a drouth while in fruit, causes early, vigorous growth and, with judicious pruning, almost invariably insures large berries and lots of them, which can be picked cheaper, sell more rapidly and bring more satisfactory results. Some seasons the difference of one-quarter of a cent a box for pick-

ing means dollars to the producer. To keep a raspberry plantation in good condition, you must promptly suppress all weak growth both by severe pruning of laterals and excision of all weak shoots.

I have heard a great deal about the self-supporting raspberry bush, but I never yet saw what to me would be a satisfactory crop of raspberries growing on self-supporting canes. That is putting it pretty strong I am willing to admit, but it is a *fact* nevertheless. One cane in a hill might be so pruned as to keep an upright position, but two or more have a tendency to branch heavier on the outside, making the stalk incline in that direction. They are swayed too and fro by every wind that blows, and weighted to the earth by showers and dew, and the consequence is, I often find, the man who preaches the self-supporting raspberry trying to get even by giving scant measure with the best berries on the top of the box.

Surface manuring is best, and unleached ashes applied in the hill in the early spring I find a valuable fertilizer. I avoid any usage that will induce growth late in the fall so that the wood will not ripen before winter.

Make up your mind not to undertake to grow small fruit unless you are willing to take the proper care of your plantation. Without a willingness and a firm purpose to spare no pains to insure success, is to accept defeat in the beginning.

FALL PLANTING THE ORCHARD.

J. P. ANDREWS, FARIBAULT.

In milder and moister climates, they find it more to their advantage to plant in the fall or during winter, when frost does not prevent. Some of the advantages of fall planting are that we have more time in the fall in which to do the work, and will be more likely to have it well done. The soil works much more easily and freer in the fall, having much more of that clammy, doughy consistency than it has in the spring, and when the frost comes out of the ground in the spring the soil settles well around the roots, which at once commence to pump up moisture to the tree, starting growth almost as early as though it had never been transplanted. This gives the tree a longer growing season, consequently a better growth than spring planted trees make, especially if planted a little late, and, having a good thrifty growth the first year, they go into the following winter with so much more vigor than a tree having made a feeble growth that the difference after the first winter is often the difference between a live tree and a dead one.

The one great mistake made when trees have been planted in the fall in this dry, cold climate, is in leaving the tops erect and unprotected. The slight evaporation through the bark and buds is a serious drainage, the fall planted trees not having formed new fibrous roots to take up moisture to supply the tops. If it has been a dry, cold winter the result of such planting will be a dead orchard in the spring—having simply dried out, a very natural result and the thing to be expected.

Our clothes freeze dry on the line in winter—the same drying process is going on in the tree tops—and the newly planted trees,

not being able to get a supply of moisture from the roots, must surely die.

How, then, shall we obtain the benefits of the fall planting and avoid its disadvantages?

In November of 1897, we planted an orchard for ourselves in the following manner: After having the ground plowed we made a deep dead furrow, north and south, for each row of trees. Then we ran a subsoil plow two or three times in the bottom of the dead furrow until the ground was thoroughly pulverized. The preparation thus far was made with the intention of planting the next spring should covering for winter not prove practicable. We then took a few of the largest trees we were intending to plant, being an inch or two in diameter and five to six feet high, and planted them in the bottom of the dead furrow, leaning them strongly to the southwest with their tops directly over the bank of the dead furrow.

After planting, the slanting tops were carefully pressed down on the bank and covered with earth. It was so much easier planting in this mellow soil—that worked like a bed of ashes—that the whole job of planting and covering was much less work than simply planting would be in the spring, when the ground is heavy, that we at once put out the whole orchard of ten or twelve hundred trees and covered the tops with earth.

After planting we covered the ground well with manure around and over the trees. In the spring as soon as the frost was out we scattered the manure so it would harrow in. We then raised the tree tops, leaving them slanting well to the southwest, and they commenced growing about as early as trees that had not been transplanted.

With tops in perfect condition, and soil well settled around the roots, the tree having the benefit of all the spring rain, it is but natural that they should make better growth than trees planted at the usual time in spring when the soil works well, which is when the excessive moisture is out of the ground, and when the fall planted tree has been enjoying wet weather for two or three weeks and is now bursting its buds and starting a growth that will not be equaled by the spring planted tree.

REPORT, 1898, CHIEF FIRE WARDEN OF MINNESOTA.

GEN'L C. C. ANDREWS.

The fourth annual report of the Chief Fire Warden of Minnesota, for 1898, is at hand, and we find it an entertaining and interesting volume. The most notable thing in regard to forest fires in Minnesota is the fact that, although there were a few weeks of dry and dangerous weather in the northern part of the state, both in the spring and autumn, our state escaped any very serious fires, while in the adjoining state of Wisconsin forest fires occurred in the fall of enough magnitude to be heralded as a calamity. The forest fires in Wisconsin, the million-dollar forest fire in Michigan in 1896 and the extensive fires in South Dakota would impress a candid person

of the value of even the little preventive means used in this state. No sensible man pretends that human agency can extinguish a great forest fire. The object of the fire warden law is to prevent such fires from starting or, if, unfortunately, they have started, to extinguish them before they become unmanageable. Prevention is the main feature of the fire warden law, as is seen in the importance attached to posting and publishing warning notices. Thus far the state has expended, under this law, less than $5,000 a year, including the one-third of county expenses which it pays; and the expense of the thirty odd counties affected by the law has averaged less than $100 a year.

FOREST FIRES IN 1898.

Reports from fire wardens, made to the Chief Fire Warden, of forest fires in 1898, show that there were 51 such fires, which burned over 21,580 acres, much of which was light timber or cut-over lands. Total damage reported, $9,063, which seems very small and is accounted for in part by some of the damaged timber being cut the succeeding winter. Seventy-eight per cent of the whole number of fires reported were extinguished or controlled by fire wardens or their helpers. A man in Todd county was made to pay a fine of $100 and costs for carelessly causing a fire which spread half mile into a neighbor's field, where it fatally burned a woman and severely injured a boy who tried to protect her. There were several other vigorous and effective prosecutions.

PRAIRIE FIRES.

The number of acres reported as burned over by prairie fires was 54,360; damage, $13,436. The number of such fires caused by burning grass, straw or stubble was 23; by railroad locomotives 14, other causes 5, unknown 25.

DEMONSTRATION FOREST.

The report, which contains numerous illustrations of the Minnesota forests, describes some of the timber country in Beltrami and Cass counties, which was visited in the month of August. A particular description is given of a splendid pine forest on the south shore of Cass lake, recently made accessible by railway; also of some very fine forest on the north shore of Vermillion lake belonging to the State University, and which the Chief Fire Warden advocates being set apart as a demonstration forest for the use of the school of forestry connected with the Agriculture College and Experiment Station. If this were done, he thinks the State University of Minnesota would outrank all other universities, except Cornell, in this country in the important science of forestry, which is so rapidly coming to the front. The Chief Fire Warden visited the Itasca State Park and points out the need of roads and paths therein.

EUROPEAN FORESTRY.

In proportion as people are informed in regard to forestry will they be disposed to use precautions against the ravages of forest

fires. With this view the Chief Fire Warden prints in his report short, fresh and comprehensive sketches of the forestry systems of fifteen European states, including Saxony, Prussia and France, which are foremost in the science. The importance of setting apart a tract of primeval pine forest by the state as a health resort is also discussed.

SUMMER MEETING, 1899, WISCONSIN STATE HORTICULTURAL SOCIETY.

"THE WISCONSIN HORTICULTURIST."

"EUREKA!" We found it, on the banks of the Fox, a quiet inland town, with one of the liveliest horticultural societies of our state. Delegates came by boat from Oshkosh, 22 miles away, and by rail to Rush Lake Junction, 7 miles, where we were met by carriages. From start to finish the convention was one round of ovation, and nothing was left undone for the comfort of the guests.

The meeting was called to order on time, and President Johnson gave us the opening address. As Dr. Loope was away, Mrs. Brooks, president of the Rushford Society, gave us a hearty welcome, and, as Dr. Loope said afterward, we "went right in and took everything in sight." Secretary Philips responded, and the convention settled down to business. The program was carried out fully except one or two papers.

Nothing before the convention was of so much interest as the effects of last winter. The general root-killing by the dry freeze, for want of snow and moisture, was the greatest Wisconsin has ever known. The two southern tiers of counties suffered most. Mr. Coe reported the worst destruction for his district. Wherever the ground had two inches of snow through January and February, the orchards, nurseries, gardens, clover and grain fields escaped.

G. J. Kellogg gave a report of the rainfall for the last 21 years, showing the precipitation for the months of September, October and November. This gave the key to some of our worst seasons of loss, when the ground froze up dry. Prof. Goff gave us a very interesting report of what we had left after the severe dry freezing of the winter. Mr. Philips reported only one variety of the 35 apples in the trial orchard at Wausau that would have to be replanted. The thermometer registered at Wausau 44 below zero but they had 16 inches of snow. The opinion prevailed that with dry falls we must apply heavy mulch early in winter for nearly everything. More time was given to this question because it was the most vital to our interests.

Interesting letters from absent ones were read, and while the delegation from the state was not large the local attendance and a big turnout from Omro Horticultural Society made things lively from first to last. The time of the convention was just right for our northern strawberry crop, and we did not have to import berries for the table supply.

J. M. Smith's Sons made the best exhibition they have had for years, both in fruits and vegetables, but G. J. Kellogg & Sons took

1st on collection of 10 varieties of strawberries and many other premiums, also first on 6 varieties of gooseberries, but the fresh picked strawberries in nearly every case took 1st on plates. There were 16 competitors for prizes and nearly one hundred entries.

On the second morning the visiting guests were given a ride to the 40 acre fruit farm of Parsons & Loope, and it was a sight to be remembered to see the Longfield apples loaded to breaking, a goodly showing of Wealthy, McMahon, Duchess, etc., and the fruit little infested with insects. There were acres of strawberries which were giving good returns, but to think of making money on small fruit and carrying it 28 miles overland to market was a discouraging feature; still they made it pay, and their acres of raspberries will give them lively times later on. Everything had wintered well, very little root-killing, and while the thermometer ranged from 20 to 46 degrees below zero, everything above ground wintered without injury. This proves that it is not the cold that kills but other conditions of the atmosphere in winter.

J. Perriam, of Chicago, and A. Simonson, of Racine, were with us during the meeting, and a better summer convention I do not remember, considering the local attendance and the large exhibition of fruits.

HOW TO SECURE A DECIDUOUS TREE BELT.

T. A. HOVERSTAD, CROOKSTON.

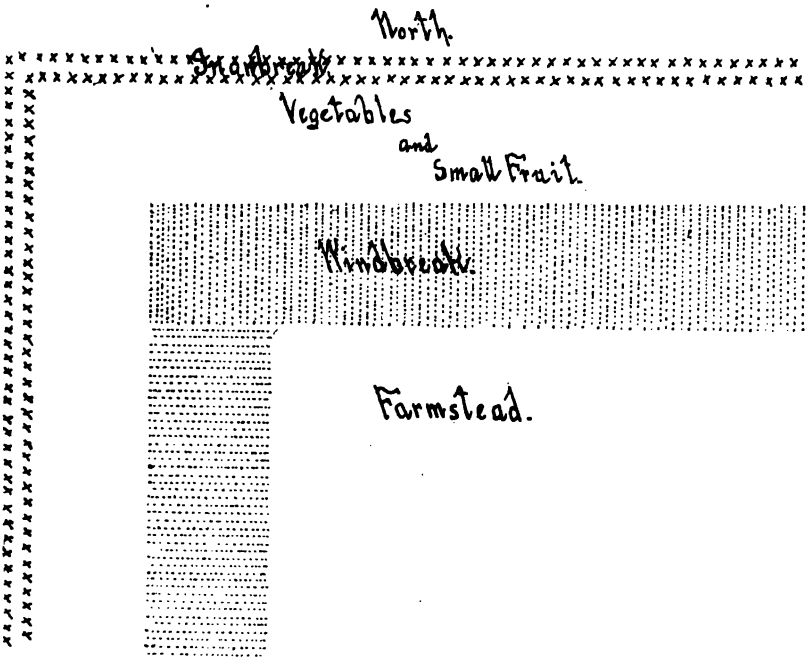
No one questions the wisdom of planting tree belts around the homes on the Minnesota prairie. The trees in such a belt, like so many soldiers, stand guard and furnish protection against the storms so frequent in the northwest. Being an urgent necessity, *beauty* in such a planting is a secondary consideration. In short, a tree belt is "useful rather than ornamental." It should furnish protection against the north, northwest, west and southwest winds. This will necessitate the belt to be planted on the north and west sides of the house.

The planting should be in two parts, that may be called respectively the snowbreak and the windbreak. The snowbreak should form the border and consist of two or four rows of trees. The rows on the north side of the house should extend east and west, and those on the west side of the house north and south. A space of one hundred feet should be allowed between this and the windbreak inside to allow ample space for the snow to collect. The windbreak should be one hundred feet to eight rods wide and should be in length co-extensive with the snowbreak. The rows in the windbreak should be at right angles to the direction of the rows in the adjoining snowbreak.

Having selected the land, thoroughly subdue the sod by raising two or more crops on the land, and if the soil is compact subsoil before the trees are planted. The trees should be set out in the spring, and care be given to each individual tree when it is planted.

There are three sources of stock: first—buying seed and raising your stock in nursery rows; second—digging up trees in the adjoining woods and transplanting them to the place where they ultimately will grow; third—buying the stock from the nearest reliable nursery. This last plan is the wisest to follow. Better stock can be had, no time wasted in obtaining the trees, and, while the outlay in money may be a trifle more than by the other methods, it will not amount to much, as the common deciduous trees are inexpensive.

The best distance apart to plant the rows is eight feet. This makes it possible to raise a row of vegetables between every two rows of trees while they are small. The cultivation can all be done with the two-horse cultivator. After the trees are larger the culti-



vation can be continued by means of the two-horse spring-tooth harrow. This will not kill all the weeds, but enough will be destroyed so no damage will be done to the trees. Hoeing and hand weeding are too expensive operations to be employed here.

Plant only the most common reliable trees. Leave all other rare, uncertain and novel varieties out of consideration. Willows, white elm, green and white ash, soft maple, box elder, cottonwood, basswood, and a few others, will give sufficient variety. Only one variety should be planted in each row in the snowbreak, while mixed planting can be practiced in the windbreak.

Plan to plant each year only what can be given the best of care. A small plantation given good care is far more desirable than a large one partly neglected. The interest in tree-planting will probably become greater if a certain amount is done each year.

DOES EXPERIENCE PROMISE MINNESOTA A HARDY, LONG-KEEPING APPLE?

(A DISCUSSION.)

Mr. Dartt: This question was assigned me by the secretary. I looked it over, and I made up my mind the question itself was a self evident proposition, and it was fooling away time to talk about it, so I declined answering, but I told him instead I would give him either a paper or a talk on the Duchess apple or the handling of it—but he is a man who gets all he can and keeps all he gets, and he held me for both.

I will say, therefore, to bring the question before you, that no one doubts our ability in the least to raise a long-keeping apple, and I want to give you a fact or two. Once upon a time a judge rendered a certain decision, and a lawyer said to him: "You can't do it." "Well," said the judge, "I have done it." Now, we have got a long-keeping apple; we have an apple on the table in the other room two seasons old. We have got an apple that was grown in 1897, and we have got an apple of the same variety that was grown in 1898. Can anybody hear this testimony and then doubt our ability to raise a long-keeping apple? We have got the Malinda, that is a long-keeping apple, and what more do we want? Do we need more evidence in that line? If so, put your evidence right in.

Mr. Harris: We have at least four varieties of seedlings in the state that are known to be long-keeping apples. There is that apple of Mr. Day's, of Farmington; there is the apple in Cottonwood county, near Windom; there is the apple at Adams, in Houston county—that is an apple that has kept for two years; and there is the apple from Hastings, which he says is a seedling. We had apples on exhibition at our summer meeting last year raised the year before, and he brought in at the same time samples of quarter grown apples and said he had kept them all summer long. Now we have these four varieties. Then we have lots of seedlings, that have not been shown at our meetings, that have kept until state fair time the next year after. I do not know the quality of the fruit, but this fact ought to be very encouraging, that we are going to get as long-keepers as anybody, and some of them of good quality, too. Mr. Day's is a fine apple, and most of them are very good.

Mr. Ditus Day: I want to say a word in regard to that long-keeping apple. I brought a plate of last year's apples and a plate of this year's apples, but the plate of last year's apples is nearly gone. Those plates of apples will keep, I do not know how long, but they are perfectly sound to the core now, and they will keep till next year. It is an apple that will keep longer than any other, and I know it to be a good apple. It is a prolific bearer, and I think it would live through a severe winter. It has never lived through a test winter. The apples have never been kept in cold storage at all, and those apples—if you will examine them—will keep for months yet.

Mr. Patten, (Iowa): I have an apple here (exhibiting) that for want of a name I call the "pedigreed Duchess." You see the condition it

is in now, and it has been kept under ordinary conditions. Speaking of the development of winter fruit, the Duchess of Oldenburg and the Golden Russet are the grandparents of that apple.

This apple I call my Duchess No. 4. Mr. Harris regards it as an apple of good quality, and you see the condition of the apple now. I think it will undoubtedly keep two months longer. So I think it is quite practicable and possible for the Duchess of Oldenburg to produce a good winter apple. I would suggest to the people here that scientific work should be done with this apple of Mr. Day's. This is a very large field of labor, as you all see. Mr. Gideon, as he has stated here, has sent out some sixty thousand trees all over the state that he has grown himself, and out of the whole multitude of seedlings presented here we have nothing that meets our wants. These may be few, but still we are in doubt whether we have secured what we desire. So I introduce this to show the enormous amount of labor it requires to produce what we wish in this matter of growing good apples. I believe it is entirely practicable, and I believe I can say to you, gentlemen, that we can certainly make much more rapid progress if we put more system and thought into this work. As you saw those apples at the state fair, you saw a great multitude of small apples. In my experience the apple seedlings I have grown will fairly average in size with the cultivated apples I grow, and that result came about not by any haphazard method but by selecting seeds grown of all the hardy standard varieties. I do not believe it is necessary for us to be producing those little crab-like apples if we observe the necessary care. As I said before, the prospects of producing an apple such as we want are very flattering indeed, if we only go to work in the right direction. There are some varieties, I find in experimenting with other apples, that are easily controlled with the pollen of other varieties. The Duchess is one of them. It is very easily controlled with the pollen worked upon it; also the Malinda. I have this year in fruiting four seedlings of the Malinda; all of them are red apples, and one of them appears to be a long keeper. One of them is about the size of the Baldwin and an apple of good quality. I also notice it hangs well to the tree. Here is an important feature in this experimental work, and one that you gentlemen who are going to interest yourselves in this work will do well to take note of. Do not go to work experimenting with any variety that falls readily from the tree. The Duchess is too faulty in that respect. If you have an apple that is as good as the Duchess and hangs well on the tree and is adapted to Minnesota, take that as a foundation, because it is a well known fact that apples of this variety fall readily from the tree, and this is especially true of all, I might pretty nearly include all, of the Russian varieties. There are of those Russian varieties quite a number that might be considered apples of good quality that are not good, simply because they do not hang on the trees ten days or two weeks longer than they do; they fall before they mature and are of no value.

Mr. O. F. Brand: I have had a little experience in originating varieties of seedling apples. Commencing with the Duchess of Oldenburg, in 1892, I went to work with the object of getting a long

keeper, or something that would keep longer than the Duchess, and I went to work with this idea as my basis: that is, if I saved my seeds from those apples which were perfect and hung on the trees the longest, I would perhaps be gaining my point of getting a longer keeping apple than the original. I fruited some fifty varieties, and in gathering apples that year I left the apples on the trees which appeared to be green until other apples were all gathered, and then I went around and gathered those apples and saved the seeds and planted them. Now as to the result: A number of them bore several years ago, and those which bore first appeared to have the greatest resemblance to the crab family. Among those seedlings some of them were upright growers, with large leaves, clean bark; others were short and spreading with small leaves; some of them blighted and died. I transplanted seventy-five of them and selected those which I thought were best. Among those which bore fruit early was one which we call the No. 12; my son called it the "Beacon." It is a little earlier than the Duchess and resembles the crab very much in habit of growth. It is about the size of the Minnesota crab and red, and when fully ripe it is covered with bloom. It is an excellent eating apple and surpasses the Whitney No. 6 in size and flavor and hangs well on the tree.

Another, which I exhibited at the state fair two years ago, is my No. 1, called by that number because it came just at the end of the row. That is the apple that Mr. Patten is looking for; something that comes in just after the Duchess is past; it is better than the Wealthy in flavor, and an apple that hangs well to the tree. It is a good looking apple, symmetrical, fine quality, and the tree a fair grower.

Another apple, which I call the No. 18, is a very large yellow apple; that is a pretty good keeper. It has an excellent flavor, like the Rhode Island Greening.

Another apple, the No. 11, is a small apple, but a very prolific bearer, from two to four weeks later than the Duchess, and of excellent quality, good enough for anybody to plant.

Another which we call No. 9, is a large apple, very symmetrical and even in size, shape and color, a handsomer apple than the Ben Davis, and not one of them drops from the tree. In that we have a quality that Mr. Patten is looking for, something that does not drop from the tree. Those apples were left on the tree until the 25th of September, a month after our Duchess were gone, and not one of them dropped from the tree. I have great hopes for that apple, but how long it will keep I do not know. I think it will be a good keeper.

Another is No. 7, very much the color of the Duchess and about a month later.

I have some other seedlings. Among the lot are Nos. 22 and 23, both red, very handsome and very good flavored apples, good keepers. They have kept until February; they are a little undersized, larger than the Minnesota crab, not quite large enough; still they are very profitable, and you could not get better for the size.

I have another seedling whose origin I do not know. It came from a lot of cider pomace. It has the flavor of the Spitzenberg.

Its color is not quite as good, and its shape and size are not quite as good, but it evidently has the flavor we are looking for, with the exception of my No. 1. I have numbered that No. 33.

I have another that has not fruited. I have been expecting great things from it because it has a fine spreading habit, with large leaves, but I have not yet succeeded in getting it to fruit.

Then I have a thousand or more seedlings from the Jonathan, now two years old. I expect there are a good many of them crosses between the Geniton and the Jonathan; I am looking for great things from them. I have also a number of seedlings of the St. Lawrence and Duchess that are very fine, and I know that among them all there are some long-keeping apples.

THE PROSPECTIVE VALUE OF NORTHWESTERN APPLE SEEDLINGS.

EDSON GAYLORD, NORA SPRINGS, IOWA.

I have hesitated to accept the position assigned me by my Minnesota friends, knowing my inability to do anything like justice to a subject that has for ages baffled the skill of our very best scholars, and set at naught the wisdom of our most profound philosophers. Without stopping to fully explain how and why this subject has recently taken such hold on the people of the Northwest, I will only say that very much of this excitement, which has well nigh thrown so many into a craze, has been brought on through the unceasing and persistent efforts of various individuals who have seen their opportunity to fill their pockets by raising and continuing this fascinating excitement. I have no wish to cast any reflections on our seedling men. Many of them are among our very best men, and many among my warmest friends. They have gone into this work believing they had struck the keynote to honest success.

I have known the history of nearly every seedling apple tree of note that has been known in the Northwest, and, after testing nearly all, I am compelled to state that there is not one I would set as a gift. The Malinda is not a seedling tree but was propagated from cuttings taken from a tree, by I. W. Rollins, that was growing in his father's yard, in the town of Stroffard, Orange Co., Vt. The cuttings were taken from the tree about forty years ago, brought to Elgin, Minn., where he propagated them for sale. Though first grown in Minnesota, the seed from which the Wealthy was produced was grown in or near Bangor, Me., over a thousand miles from its adopted home in Excelsior, Minn.

I have long been convinced that all our seedlings have come to us from being grown on unusually favored sites. I have not been able to learn of one that has not been grown on sites as high as two or three on a scale of one to seven. The original Wealthy occupied the hardest site of any I have known, but it was killed down in 1885, and nearly every tree was swept from the Northwest. I fully believe that a duplicate season of 1884-5 would sweep away every seedling except the crabs and hybrids and such others as have been properly top-worked. Our best results will come to us by acclimating,

but when this is accomplished the hair on our boy's heads here present will be gray as rats, and the road to success through planting cross-fertilized seed will, when fully measured, prove but little better. I venture to say not a single seedling of any value in the Northwest would ever have survived a season like that of 1885 if they had been occupying sites lower than three or four. The most serious difficulty our seedling men have now to confront comes from the fact that we have no real established pedigree among our apples. They have been mixed and re-mixed in every conceivable way for the last three thousand years till they are now one heterogeneous compound of mongrel varieties, so intricately mixed that no skill can separate and arrange them for future use short of long years of the most skillful efforts of our wisest and most profound scientists. One of our own state, a noted horticulturist, did not miss his mark when he said that if we were to continue the work of trying to originate more valuable varieties from seed, we should at once employ some one especially educated along this line of work. Now, if our learned professor was not capable of carrying on this work, what can we expect by urging everybody to go at once into it, when success is so extremely doubtful even in the hands of experts who have had plenty of time and means to carry it on.

Learned scholars tell us the same laws govern both animal and plant breeding. Prof. Johnson, a noted animal breeder, tells us, "It requires profound study of animal life to become a successful breeder." "This," he says, "will not be questioned." He further says, "No conceited tyro or mere theorist need expect any results of value.

If, as he says, the road to success in animal breeding is beset with so many uncertainties, how much more are our apple tree breeders beclouded along their road. What can we hope for, or expect, from the efforts of totally unskilled hands who have never learned the first letter in the alphabet of plant or animal breeding. This advice would be the height of folly even where the environments are perfect. How different where almost every step taken to gain success is confronted by stubborn opposition. Let us turn back the pages of history and examine the advancements made in our apple tree breeding in the Northwest for the past fifty years. We have secured the Wealthy, the best of all, and this forty years ago. Have we secured anything better? Echo answers, "No!" Our friend Gideon almost in his maiden effort produced the Wealthy, which is now the peer of all we have known in the Northwest, but he does not claim any special skill on his part. There is not a half hardy kind we ever tried to grow here that could not have been successful, if set any time since 1884—and this on almost any site over the Northwest. Hardy peaches have scarcely lost a bud since 1884-5! If these statements are not correct I would kindly ask my seedling friends to correct such here, that I may have a reasonable chance to defend my position. But in such cases as we had the Wealthy, Fall Orange, Jonathan, Connecticut, Seek-no-further, Ben Davis, Willow Twig, and many others, properly top worked, we saved them, while all on their own stems went out, with scarcely an exception, except here and there one which, perchance, happened to be occupying some peculiarly favored location.

I do not in my day expect to see any seedling apple originated in the northwest, superior to what we now have in our present seedlings, *or can have by properly top-working* our old reliable kinds on to *extremely hardy and congenial stocks*, but I do expect to see new and more valuable kinds added to our list that will no doubt come to us by top-working from New England, the middle and western states. My reasons for this I think are plain. The apples first brought to this country came from north central Europe, a land congenial to the apple, but since their advent we have unmistaken evidence that the environments here have proved to be *more congenial* to *the apple* than they were in the land from which they came. This position is sustained from the fact that the apples here have so much improved as to be shipped back from whence they first came and are now driving their ancestors to the wall in many of the higher markets of Europe. In short, they now have nothing that compares with many of our best American apples that have been originated in our best apple belt. But for various causes, known and unknown, we in the northwest have fallen behind our southern and eastern friends in originating and producing choice apples. A kind Providence has seen our unpleasant condition and has recently come to our aid and has blazed out a *new, short* and *direct road to success*. In short, the good Lord has marked the way through to success and made it so plain that a child can follow. We can grow, not only a great majority of our old choice kinds we have coveted so long, but at once we can catch and hold a majority of such new and desirable kinds that either skill, luck or chance may place in our reach, for I do not claim it beyond the possibilities of man to produce a new seedling here in the northwest more valuable than any we now have. But unless you infer from my remarks that I deem it useless to attempt to make an effort to originate or secure new apples here, I will say that "nature with her still kind hand oft doles out to man her choicest gifts." You have your watchman on the tower; he is a good one, keep him there. Give him a search lamp and means to supply its wants so that oft as nature presents to view something valuable it can be kindly taken in and propagated for the benefit of the masses. I would much sooner run my chances in securing something valuable along this line than to expect to secure such by the direct hand of man by way of cross breeding, etc. Had we followed this plan years before, I know we should have been now in the possession of many more choice varieties of fruit than we now have, some which I know by my own personal knowledge to be superior to any we now have. I know of at least three native plums and one apple that have been lost to us by careless and shameful neglect in our own vicinity. I have not the least doubt today that there are hidden, and to the world unknown, many superior varieties, especially apples, along the line of our most congenial apple belt, many equal and some superior to any we now know, that can be brought to the Northwest and made by top-working of great value. The now famous Baldwin, Grimes' Golden and other varieties of highest grade, have only come to us after the original trees have been grown old and rotten; or, rather, af-

er holding out their superior apples for over fifty years were they brought to notice and, even then, by *accident*.

But lest you think I am wandering from my text and failing to give the prospective value of our Northwest seedlings, I would ask all present, would any one here take ten thousand seedlings, even after they have been grown one year, and agree to care for them properly for ten years for less than one dollar each. Then, who here would agree to pay ten thousand dollars and take them off the propagator's hands with all the superior varieties that might be found developed in the lot. I very much doubt if there is any one in this room that would give twenty-five dollars. I should want much more than this to take them off the propagator's hands. This, I think, settles the prospective value of our new seedlings for the Northwest, at least it does in my mind. Notwithstanding all I have said against everybody going into this business blindly, I would say to such as have *means, time, patience, care* and *taste; keep right on early and late* and by some hook, crook, or chance, you *may* possibly succeed in bringing out some new and more valuable apple than we yet have in the Northwest. By doing this, even if by chance you find it self-produced and carefully hidden in some nook or fence corner, it matters not, so you get it and bring it to the front. But when our seedling advocates set up the claim that by their direct acts they have or are about to produce a more valuable kind than we now find in our Northwestern seedlings or than we *can* produce at once and make a success of here by securing from our most congenial apple belt their best varieties and top-working them here, I *most emphatically deny it.*

COLD STORAGE OF APPLES.

A DISCUSSION.

Pres. Underwood: You would perhaps be interested to know something of our experience in this matter of cold storage. Our apples were carefully packed, screwed down and in that condition sent to cold storage. The apples shrunk in the barrel and became so loose that they rattled around the barrel and spoiled the looks of the fruit. They did not ripen up enough before they were put in, so that I am certain if we want to avoid these mistakes we must allow them to ripen in the barrel before they go into cold storage. I am telling you of our mistakes now. I was told I should use a regular apple barrel. I had them made to order; I could just as well have had something else made. I found that the regular apple barrel would not go in the market. They want a three bushel barrel instead of a eleven peck barrel.

Mr. Dartt: I shipped a carload of Duchess to Minneapolis cold storage, about the same as those mentioned by the gentleman, and they were loose in the barrel, too. They were packed tight, but when they got there they were loose, and they were so long getting there that they were not in the best condition. My belief is that ordinarily we cannot ship apples very far and get them into cold atorage in good condition. These apples I had that experience with cost me

about a dollar a barrel to get them to storage and to pay the storage for two months, and when they were finally sold they brought me seventy cents per barrel. Apples that were shipped to Minneapolis about that time came in competition with the apples that were shipped from Michigan by way of Lake Superior and Duluth, and they put their apples in at a lower figure than they could have come from Owatonna. I shipped some apples this year to cold storage that whenever the market went flat would not bring enough to pay for shipping. I had about forty barrels on hand, and I did not know what to do with them, so I thought I would put them into cold storage. I did so, and they finally sold for enough to pay storage, freight, etc. The commission man told me that if it had not been for the rise in the price of apples this year my apples probably would not have brought me a dollar a barrel. My motto has always been, "Fools for luck," and that time I got just enough to pay for my trouble. I do not know anything more about cold storage except my own storage plant.

Mr. Elliot: Speaking of cold storage and preparation of fruit for market, in my travels I have seen different methods adopted. In September when it is warm, as it was this year, it seems to me it is not wise to pick apples and put them right into the barrels. In California they put their apples in heaps and put straw over them to shade them and let them remain in the open air; then they sort them and barrel them. In going through one of our retail stores I noticed a box of Washington apples, and I detected wheat chaff in the box, from which I inferred that that was the method pursued there, to pile them and cover them with chaff and straw. If I were growing apples to put into cold storage, I would adopt the plan of putting them into a cold room and letting them remain there a week or ten days to ripen and show the imperfect apples. I do not care how carefully you select them, you will always find some imperfect apples. No one can explain just why this is so, but that is the reason why your apples were loose in the barrel. I think they shrink a little. After they have been through a sweat, apples will be in a better condition for storing than if immediately put into cold storage.

Mr. President: How long do you think it would take apples to ripen in the barrel?

Mr. Elliot: I don't know; it would depend on varieties.

The President: How long would it take the Wealthy?

Mr. Elliot: I should say at least ten days.

Mr. Hartwell: Would it not depend on the weather?

Mr. Elliot: Yes, I think it would to some extent.

Sec'y Latham: I have had a little experience with cold storage on a small scale, and the first experience was the most successful I ever had. During the fall of 1892 I purchased a good many barrels of Wealthy apples for the Minnesota exhibit at the world's fair. They were carefully selected, gathered and barreled, but through some oversight they were not shipped as I intended they should be; they were left in somebody's woodshed. When I discovered the fact, I went in haste and examined the fruit and found it was already very

mellow. It was sent at once to Chicago and put into one of the chemical cold storage houses. They were taken out after the first of May and along during the summer months, and we had apples on exhibition until Wealthy apples came again. During the last of the season, however, a good many were quite poor. During the first part nearly all were good, and they were of excellent quality and fine eating. That we gave away that sort of fruit had a good deal to do with Minnesota's successful exhibit. From my experience I should say that apples to be good eating when taken out of cold storage should be allowed to ripen after being gathered before they are placed in cold storage. My next experience will be along the line of placing fruit in cold storage after it ripens.

Mr. C. L. Smith: In answer to the question of the president as to how long it would take the apples to ripen up nicely. Accidentally I think I stumbled on to the answer to that question. At the time of the state fair two years ago I had a barrel of apples that with the exception of the top layer were all green. I was disappointed and shoved them into the wood shed. That was on the Tuesday the fair opened, and I forgot all about the apples, and they were in that shed just ten days, when, disposing of some other apples, I looked at that barrel. They were then colored some and everybody pronounced them the finest eating apples they ever had. In ten days they had ripened up very nicely. They were not over ripe and had colored up in nice shape. I was very much surprised.

Mr. Hartwell, (Ill.): We get a temperature of twenty degrees below, and a neighbor puts his apples in a bin with nothing but a single thickness of boards around them and expects them to freeze solid. He expects the outside layer to be ruined, but inside they are just as good as when put in. Those apples are really frozen, but no harm comes to them unless they were allowed to thaw out in a warm atmosphere.

Mr. Barnes, (Wis.): A little experience I encountered last week might be of benefit to you. I had eleven barrels of choice apples in the outside cellar. Unfortunately, somebody left the double doors open, and the apples froze. As an experiment I took two or three and stood them on the mantlepiece in the kitchen, and I wrapped some in paper and put them in the pantry, and two barrels I rolled into the coldest corner of my house. Those I put on the mantle when thawed out became a little bit soft. Those I wrapped in paper and put in a cold corner of the pantry came through apparently just as good as they were before being frozen. I expect to find those eleven barrels in first-class condition when I come to open them. If any of you are unfortunate enough to have your apples frozen, put them in a cold corner of the cellar and let them thaw out gradually, and they will take no harm.

Mr. Dartt: When apples are frozen hard enough to rattle when they are handled, they are gone up. If they are not frozen so hard, and you thaw them out, they will be pretty good.

Mr. Philips, (Wis.): An apple is a good deal like a rattlesnake If it freezes but once, and you let the frost come out gradually, they will be all right. If a snake freezes a second time it is no good, and it is the same way with apples.

Mr. Yahnke: We bought some apples in Watertown, Wis., last fall. Before we could get to picking them it was ten below zero. We let them stay a day or two until the weather was better, and then we picked them and barreled them and sent them to Hastings, and they gave good satisfaction. (Laughter.) That may sound a good deal like a big fish story, but I can furnish you witnesses for the fact.

Mr. C. L. Smith: Oh, that's nothing; I have seen men making hay on the ice. (Laughter.)

USE OF THE CURRANT IN THE HOME.

MRS. MARY THOMPSON HOVERSTAD, CROOKSTON.

The old proverb: "To the making of books there is no end," might as truthfully be rendered "To the making of recipes there is no end."

Cook book compilers, magazine writers and teachers of cookery seem to vie with each other in giving a multiplicity of methods for preparing the different foods used by man. Many of these methods are bad, some indifferent and a few good.

The necessary variety in our diet may be secured in two ways: first, by the use of the various meats, vegetables and fruits, and, secondly, by preparing them in a variety of ways. It is well to so prepare the foods that are in daily use and that admit of it, but as many foods are par excellence when prepared in a fewer number of ways, variety in this latter case should be secured by using all the different foods in that class.

As most of the small fruits are raised in Minnesota, I would not advise preparing the currant by all the possible modes, but rather confine its use to those preparations in which it appears at its greatest perfection.

Currant jelly is universally recognized as the finest of all jellies. The currant because of its brilliant color, pleasant tartness and jelly making qualities, is peculiarly adapted to this use. No thrifty housewife is content unless her larder contains a generous supply of this delicacy.

To have it in perfection, select underipe fruit, then boil the extracted juice the allotted time, twenty minutes, without the sugar; after the sugar is added, and it boils again, pour at once into the glasses. The observance of these two things will insure a jelly, and one that is brilliant in color and delicate in flavor.

The currant is also well adapted to the making of fruit juice, and ranks next to the grape for that purpose. Our grandmothers were in the habit of fermenting this juice, and currant wine was a common drink, but the fruit jar of today enables us to preserve the unfermented juice perfectly. To make currant juice, extract the juice as for jelly, boil it five minutes, then add a cup and a half of sugar to each quart of juice and when boiling again seal in the common fruit jar. For a beverage dilute this juice with an equal amount of water and serve with chipped ice. It is exceedingly cooling and refreshing. This ade may be frozen, making a currant ice. If a spoonful of gelatine is added before freezing, we have a

currant sherbet, and if it is frozen only to the consistency of mush, it becomes the popular frappe.

The uses to which this juice may be put are quite varied. A delicate dessert is made by stiffening the diluted juice with gelatine and serving whipped cream with it. The diluted juice may be thickened with cornstarch and served cold with plain cream, or it may be added to cooked tapioca or sago, making still another dainty dessert. It may also form the base of a sauce to be served with a steamed or baked batter pudding.

Spiced fruit is a desirable accompaniment to cold meats. As peaches and pears, two fruits preeminently fine for spicing, are not produced in this state, the Minnesota housewife must needs use other fruit, and spiced currants is a dish not to be despised.

Sometimes very excellent results are obtained by combining two or more fruits. The blueberry is greatly improved by the addition of some currants, as they furnish the tartness the blueberry lacks. The currant also combines well with the raspberry.

I think our husbands are not alone in recalling with pleasure dishes made by mother. It gives me pleasure to call your attention to a dish that was daily served at my mother's table during the short season of the currant. We would call it a currant pan-dowdy. Into a baking dish was put a layer of currants about an inch in depth. Flour to thicken the juice was mixed with the sugar and added, and the whole covered with a sour milk biscuit dough. The resulting pudding was greatly enjoyed by the entire family.

MOLES AS INSECT DESTROYERS.—Moles are generally considered destroyers of lawns and disturbers of the garden. It has been pointed out that these animals do not live upon vegetable matter, but upon insects entirely. An investigation to find out upon what moles subsist was instituted by the Pennsylvania experiment station. H. Wilson in reporting upon the results of this work stated that the stomachs of 36 moles had been examined. He concludes that vegetable matter is not taken into the mole's stomach intentionally as food, and he believes that the mole is an insectivorous animal. Its habit of burrowing among roots of grasses and other plants is induced simply by a desire to get at worms, beetles and other insects which are found in the vicinity of plant roots. Mr. Wilson thinks the mole is beneficial to the agriculturist, although in some instances considerable annoyance is caused by the moles burrowing under the roots of growing plants while in quest of insect food. The damage caused by eating the grain seeds and fibrous roots is due to mice rather than to moles. The runways of the mole are taken possession of and occupied during the summer and autumn by meadow and field mice, and these little animals are undoubtedly responsible for much of the damage thought to be caused by the mole. To keep moles out of lawns and flower beds Mr. Wilson suggests the use of traps and poisons, driving them away by placing such substances as mineral pitch, gas tar and other material of unpleasant odor in their runways.

THE DUCHESS APPLE AND HOW TO HANDLE IT.

E. H. S. DARTT, OWATONNA.

Before you handle the Duchess apple you must get it. That is the first thing to do, and you will not get it unless you set it on favorable ground. If in southern Minnesota you set it out without any protection, it will not grow. I have known lots of them to kill out.

Now, the handling, of course, depends upon the cultivation of the orchard, whether it is carefully cultivated, well manured and in good condition—and then you will get apples larger and earlier than you will from a neglected orchard. I have had experience in that line this year. In one orchard the apples were small and inferior, and in another orchard that was young and thrifty we commenced picking nearly a week or ten days before any of the other orchards were picked. Those early apples I sold on the market netted me nearly $3.00 per barrel, and the other apples coming in competition with the Duchess brought me only $1.50 per barrel; just enough to pay for getting them to market. In the first case I picked the largest apples through the orchard. I would pick before fully ripe, but pretty nearly ripe, and I picked all I could at that time. If you cannot market them at once, if the market goes down, you must either let the apples rot or else you must have cold storage to put them in. Every man who raises Duchess apples to any amount should have cold storage, and then place the apples in cold storage before fully ripe. In that way he can keep them until the rush is over.

For picking apples I have an apple cart. It is a high wheelbarrow with two long handles and two wheels at the foremost end. It sticks up in front about six feet high, where there is a platform. The men take that and run it right under a tree, and they say it is handier than a step ladder. I put my apples in crate that will hold a bushel, and then put them in cold storage. I can stack those crates, and I put almost as many in the same space as bulk apples. I set them all close together, as close as I can, and generally there is room enough for the cold air to come down from above and circulate through the crates. In my method of storage the lower crates keep remarkably well, but the top crates do not keep as well. I stack them up about five or six feet, but the highest do not keep as well, for the reason that the cold air goes down and the warm air rises. I do not know that I can tell you anything else that will interest you in this line.

Mr. Elliot: How long do you keep them?

Mr. Dartt: The apples are put into cold storage until I sell them about the first of November.

Mr. Elliot: What did you get for the last?

Mr. Dartt: Sixty-five cents a bushel. Understand, I could not have sold the Duchess apples at the time I put them in storage; I could not have sold them for anything. Duchess apples must either rot or be put in cold storage.

Mr. Elliot: Where did you find your best market?

Mr. Dartt: Minneapolis was the best market I had, unless it was Fargo or Grand Forks. I sold some up there, and they paid me a little better than Minneapolis after the first shipments; they sold for pretty nearly $4.00 per barrel. In a week the market dropped right down to $2.00, and then to $1.50, and then to such a low price it would not pay to ship at all. The Fargo market was very good; at first they netted me over $2.00 per barrel, and then the market flattened out.

SOMETHING ABOUT THE TREES NEAR MY HOME.

MISS MARTHA DENISON, MINN. COLLEGE OF AGRICULTURE.

The one feature which we first notice about a place is its trees. There is something about them which adds very much to the appearance, making a place more attractive and more homelike. Is there any home more lonely or more desolate than the one where there are no trees?

We first think of them from an ornamental point of view, without considering the purpose each one serves, and it is only by study of the different trees that we are able to appreciate their true value.

During the hot summer we find the trees a great comfort in protecting us from the hot rays of the sun, and if planted close enough together they serve to break the effect of the warm winds. During winter, or when it is colder, a shelter belt of trees is found a great benefit as a protection from the cold northwest winds and also in keeping the snow from drifting near the buildings.

Near my home, in Rice county, the soft maple and the white willow are used generally for shelter belts, but occasionally we find the white pine, Norway pine and Scotch pine used for this purpose, or, perhaps, the white spruce to a limited extent.

The soft maple is grown quite extensively, the principal reason being that it grows very easily from seed which matures in the early summer, and if planted that year quite a growth will be made during the season. It is a desirable tree because of it rapid growth, but there is also an objection because of its being easily broken by the wind,and it is apt to sunscald if not properly protected. As an ornamental tree it is used but very little compared with the sugar maple, which,although it grows very slowly, takes on a much more beautiful form than the soft maple, and in autumn the leaves are brilliantly colored, making a fine effect. The wood of both varieties is valuable as fuel and is used a great deal in the interior finishing of houses. The sugar maple is also used in the manufacture of furniture and for flooring. Maple sugar is obtained from both the soft maple and the sugar maple.

The white willow makes a rapid growth and is a desirable tree for a windbreak. It is usually propagated by cuttings, which grow readily. It does not form a very beautiful tree, as it is rather spreading, but where there are several together, with their straight, uniform branches, the effect is quite pleasing.

On one farm, a short distance from my home, a row of willows has been planted on either side of a lane, and from this the farm has been named "Willow Lane Farm."

Quite often we find farms named for some particular variety of trees grown commonly on that place. One has a great number of maples and is called "Maplewood Farm," while another is distinguished for its oaks and is called "Oakland Farm."

The white oak and the bur oak are quite common in Rice County. The white oak forms a noble and picturesque tree. It is highly esteemed as an ornamental tree on account of its sturdiness and magnificent spreading form. It is one of the hardiest trees, but is seldom planted because of its slow growth. The wood is strong, very heavy, tough and close grained and is of great value in the manufacture of agricultural implements, for interior finishing of houses, cabinet making and fuel.

The bur oak is a large, magnificent tree and is the most durable and longest lived tree in this section. It is very valuable for timber, although the wood is coarser grained and not so strong as that of the white oak.

Evergreen trees are grown a great deal and are highly esteemed because of their constant color during the entire year. They are stately trees, with their branches almost touching the ground. The pines, Norway, white and Scotch, form beautiful trees and grow quite rapidly. They are used as ornamental trees as well as for windbreaks.

The timber yielded by the white pine is the most useful in this country. Norway pine is sometimes used to take the place of white pine, but is not so good.

The white spruce is a favorite tree for ornamental purposes. It is conical in form and grows to a great height, although somewhat slowly.

Among the native trees are the aspen poplar, cottonwood, white elm, black cherry, wild crab and wild plum. Scattered here and there were groves of the aspen poplar, which, with their trembling leaves and greenish white bark, looked very pretty, but the poplar is a short lived tree, and only a few trees are seen now.

The cottonwood grows to a great height and is longer lived than the aspen.

The elm grows well and makes a pretty tree with its long sweeping branches.

The black cherry, wild crab and wild plum are very common and grow and fruit well, but during the last few years all such trees have been cut down to make room for others thought to be more important.

In many places the natural timber has been cleared away, and some cultivated varieties planted, while in others there is not the trace of a tree left.

It may be worth while in this connection to quote from the Hon. Eliza Wright, who says: "The nation which neglects its forests is surely designed to ruin. If the trees go, men must decay."

PEAR AND APPLE BLIGHT.

H. E. VAN DEMAN, PARKSLEY, VA.

This species of blight is due to a very minute germ which finds access to the tender cells and juices inside the protecting bark of the tree. There is multiplies into the untold billions, turning the healthy sap into a poisonous fluid, and causing serious injury or death to a part of a tree and in extreme cases to the entire tree. What will stop it? When the blight is rampant in the orchard, very little, if anything, can be done to stop it. The dead and dying leaves and branches are but the natural results of the disease that has long been ravaging the vital parts within. It is the sickly portion of a blighted leaf or branch that contains the elements of danger.

Fighting fire blight can only be done effectively by preventative measures. Nothing will cure it, so far as known, short of fire. Nor will spraying even check it. The disease is too deeply seated to be reached by outside treatment. It will go from apple to pear or quince trees, or from them to the apple. The wild red haws and some other pornaceous trees are slightly effected by it. The germs will not multiply when the temperature is cool. They lie dormant during the winter time, and under the warming influences of spring they begin to grow. A liquid oozes out of the diseased branches, which contains millions of these deadly germs. This is carried on the feet of insects and in other ways to neighboring trees, where the germ finds lodgment. They are often introduced through the delicate floral organs, where they find easy access to the circulating sap. From there the disease soon spreads into the twigs and then into the larger branches. They also enter through the tender growth of the new wood. It is there that the disease most commonly appears, especially on apple and quince trees, during the warm, sultry weather in June and July, when the shoots are very tender. Where thunder showers are very frequent in mid-summer, the conditions are just right for the introduction and propagation of the disease, which has caused some to think that electricity did the damage.

As has already been said, preventive measures are the only kind to use. The source of infection must be destroyed. If the sickly, half-matured twigs are cut off below where any disease exists there can be little opportunity for its spread. The great difficulty is, to know when we are below the disease. No one can tell absolutely how far down it may extend, except the most skillful scientist, and with a compound microscope. It is usually safe, however, to cut a foot or a little more below where there is the least outward sign of any affection. If the cut is not made below the diseased part, there is great danger, if not certainty, of carrying the germs on the knife or saw to healthly wood in cutting off other branches. The trees should be carefully gone over in late fall or early winter, but any time before the trees bloom will do.

A DRY SEASON decreases the yield of potatoes, but increases the starch content. A wet season has the opposite effect.

Calendar for August.

O. M. LORD.

Nearly all fruit growers advise us to discontinue cultivation in August to allow the wood to ripen, as cultivation has a tendency to prolong the growth, leaving the wood succulent and more liable to winter-kill. Nurseries and fruit fields that were cultivated late last year and kept clean, suffered more from the winter than those that were not so well cared for. But we know that last winter was exceptional, and in a series of years it pays best to keep the ground free from grass and weeds, especially with young stock. A week of rainy weather in July upset our work in cultivating, and although we kept the cultivator going when we could every bit of grass and the weeds started into growth with the cultivation; so that if we do not cultivate more or less in August we shall be overrun with weeds. Especially is this true of nursery stock. Strawberries, of course, must be kept clean, but we shall be glad this year to see the frost to help us master the purslane. The winter was not so destructive to insect life as it was hoped. With the exception of black aphis and web worm, insects injurious to fruit are very prevalent. It pays to gather and destroy fallen fruit during this month.

Our old strawberry bed could not be burned over this year after the picking; the weather was too wet for several days after mowing. We used the horse rake, instead of burning, and then run the plow between the rows and harrowed, as usual. I would prefer to burn if I could in season.

Though there is no disease nor injurious insects to be seen, a good many of the older fruit trees, though leafing out this spring, have not vitality to stand the July heat and will probably be found dead next spring. The young apple orchards are making a vigorous growth, and if a succession of moderate winters occur we may again look for fruit in abundance. And yet the severity of the winter may not always be considered, as some of the so-called tender varieties fared better last winter than some that have been considered very hardy. Why this is so we do not know.

Grapes need very little work this month. They are later than usual but at present appear to be doing well.

Currants. If a second brood of worms appear, now is the time to destroy them. Paris green is the best application, either with water or the dust gun. The currant worm appears to be the only serious drawback to plenty of the fruit, and the worms are easily controlled if taken in time.

Gooseberries are becoming more popular. They also are liable to destruction by the worms and need the same treatment as currants. Some kinds are subject to mildew, and it is doubtful if it pays to plant them, but the Houghton and Downing are comparatively free and do well in most places.

Secretary's Corner.

CAN YOU SHOW FRUIT AT THE STATE FAIR?—This is not so good a fruit year in our state as some, and the aid of every one interested in repeating the good show of last fall is urgently needed. Will you kindly inform the secretary, without waiting for personal application, what you can do in this way, and, if desired, tags will be sent you for use in storing fruit at Minneapolis in preparation.

WHITE FLOWERING ALMOND.—"President Pendergast at our summer meeting gave out a list of hardy flowering shrubs and said that the flowering almond would be one of the best if entirely hardy. I know the pink blossomed are not hardy, but the white ones are entirely so. I have grown them for more than twenty years."

J. T. GRIMES, Minneapolis.

A HORTICULTURAL SOCIETY IN VIRGINIA.—There must have been at some prior date a state horticultural society in Virginia, as the report received in this office speaks of the society as re-organized March 3, 1897. This, their first report, for the year 1898, is an interesting volume of 110 pages, edited by the secretary, Geo. E. Murrell, of Fontella, Va. Nearly every southern state now has such a society, though some do not as yet publish reports.

HAVE YOU RETURNED THE JULY SUPPLEMENT?—In the July number was placed a supplement, which was really a blank to be filled out with certain information needed in this office for statistical and other important uses. If you, dear reader, are one of those who have not yet sent it to the secretary filled as requested, will you kindly give the matter early attention? Do not think, because of a personal acquaintance with the secretary, that he knows all the facts it would contain. He does'nt know so much, but he is very desirous *to know* these facts for the ultimate benefit of yourself, in common with others interested in our pursuit. Please send in very soon.

STORE FRUIT FOR THE WINTER MEETING.—Tags will be supplied on application to this office to be used in placing in cold storage for that occasion anything you can display and that will not keep till then in the cellar. Any varieties that will keep in the cellar may be held in that way if preferred. A separate list of premiums will be prepared, without doubt, this year for fruit so kept, as well as for that in cold storage. The cold storage facilities arranged for by our society are, however, a great convenience, not only in enabling us to exhibit fruits out of their season, but also in storing fruits that would keep in the cellar, as by so storing it is on hand in Minneapolis when wanted and can be delivered at the place of meeting without danger of freezing. You can use either or both places as convenient, but in any case help us out in the display.

BIENNIAL SESSION, AMERICAN POMOLOGICAL SOCIETY.—The regular session of this association is to convene at "Horticultural Hall" Philadelphia, on September 7th and 8th, 1899, as guests of the Pennsylvania Horticultural Society. A very low rate, on account of the meeting of the G. A. R. at the same time and place, makes a large attendance certain. Our society should be represented, and if any of our members are planning to be in Philadelphia at that time, they are invited to correspond with the secretary and secure the necessary credentials.

Our readers will recall the engraving of this hall used as a frontispiece in the June, 1898, No. and the brief description in Secy's Corner. It is, undoubtedly, the finest structure of its kind in America. We note many familiar names on the program and among them S. M. Emery, Montana, Prof. E. S. Goff, Wisconsin, and Prof. S. B. Green, of our own state. It is a great program, and we should like to hear it. Prof. Green's topic is "Horticultural Schools of the High School Grade," and Prof. Goff talks on one of his favorite subjects, "American Plums for America."

THE SWEEPSTAKES APPLE PREMIUM.—The special premium of $100 offered by J. W. Thomas & Co., of Minneapolis, last year, at the state fair, to be divided among all the competitors for the sweepstakes apple premium pro rata, is offered again this year in the same way. Besides, the state fair association offers first, second and third premiums of $25 00, $15.00 and $10.00. (See page 44, state fair premium list.) Apples used in making up this exhibit need not be grown by the exhibitor but may be collected anywhere within the state. The competitor need not, if he chooses, have in this exhibit a single apple of his own growing. It was hoped that this method of making an exhibit would result in bringing out all the varieties grown in the state, and the result has in large measure fulfilled the expectations. Every exhibitor in our department at the fair can also make an exhibit in this class and be sure of some premium in return, the way the $100 is divided, and, besides, you will assist us in making this *the best year* so far in Horticultural Hall. Bring for this purpose what varieties you and your neighbors have and extend your researches as far abroad as you may have time and opportunity.

A CORRECTION FROM JULY NO.—"In looking over your July number, I note that Mr. J. M. Underwood, in his report of the annual meeting of the Wisconsin Horticultural Society, makes me responsible for the following:

"'Plums: Quaker, Ocheeda, Berkman, Dewain, Purple Gage. Burns brimstone under the tree for curculio. Sprays with tobacco and Paris green.'

"Now, Mr. Editor, I have fought the curculio for many a weary hour during the past six or seven years; I have often considered brimstone in connection with its destruction and have figured in my mind just the kind of lake of fire and brimstone that would be suitable, but I have never burned brimstone under the trees. Neither have I sprayed with tobacco and Paris green. We get up before

breakfast down here in Wisconsin, when we are after curculio. The early bird is always slumbering, and even the worm is still abed when we get at work with sheet and mallet. After a few years of this sort of thing, one does not relish being made to say that brimstone, Paris green and tobacco are sufficient. Further, I am totally unacquainted with Dewain and Purple Gage plums, and the list reported under my name is entirely incorrect. Will you kindly make this correction?"—Frederic Cranefield.

Some one said it, and I thought it was Mr. Cranefield.—J. M. U.

CHEMISTRY OF THE SOILS AND FERTILIZERS.—By Prof. Harry Snyder.—A little book of 275 pages with the above title has just been issued by Prof. Snyder, professor of chemistry at the Minnesota College of Agriculture, primarily, it appears, for use in his classroom in teaching, as he expresses it in his preface, "the principles of chemistry which have a bearing upon the conservation of soil fertility and the economic use of manures."

This book is divided into chapters as to general subjects, and these subdivided into paragraphs, each one being headed with a few words in black-faced type indicating the topic treated upon therein. While each paragraph is a link in the chain of the subject matter treated of in the chapter, yet the writer, in running over the book and reading one here and there, found each one practically a finished and concise treatise in itself and not one so technical as not to be of sufficient interest to desire to complete its reading and get the whole of the thought it conveyed.

The book is intensely practical. It can be read continuously or by selecting at a glance by the aid of a full index and the headlines referred to the subject it is desired to investigate. Any agriculturist or horticulturist who is interested in knowing how to select and care for the soil and "the way of it," will find the price of the book, $1.50, an excellent investment. In size and general appearance this work is a very good counterpart of that issued on "Vegetable Gardening" by Prof. S. B. Green, of the same school, and should have a place beside it in the library of every practical cultivator of the soil.

A GOOD SHIPPING CRATE.—To make a bushel shipping crate for holding vegetables, fruits, etc., get inch boards 10 inches wide and 10 to 12 feet long. Saw these up into pieces one foot long for end pieces. Secure plastering laths, which are exactly 4 feet long, and saw them in two in the middle. Use these for the sides and bottom of the box, putting six on each side, five on the top and five on the bottom, making 22 in all. You will then have a box two feet long, one foot wide and ten inches high. If you are to ship to a distant market, saw one lath into four pieces and nail four of these on each end, over the ends of the slats which form the sides. This strengthens the crate considerably. These boxes can be piled up in wagon loads or on cars, and are easily handled, and the purchaser can see just exactly what kind of fruit he is getting. They should not cost more than five or ten cents each.—*O. J. Farmer.*

A PYRUS BACCATA ROOT-GRAFT ON PYRUS MALUS ROOT.
(See opposite page.)

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THE RUSSIAN REMEDY FOR ROOT-KILLING OF APPLE TREES.

PROF. N. E. HANSEN, AGRICULTURAL COLLEGE, BROOKINGS, S. D.

[See frontispiece.]

The past winter has wrought wide spread destruction in the northwestern nurseries and young orchards, and the afflicted area extends far to the south. Hundreds of thousands of apple root-grafts have been root-killed, and the tales of woe come from very many localities. The winter of 1872-3 will long be remembered by fruit men for devastation wrought, the winter of 1884-5 was another, and now that of 1898-9 is added to the list.

At Brookings we find apple root-grafts root-killed every winter unless deeply covered. Several thousand were root-killed in the winter of 1896-7. Root-grafts that had made a good growth in 1897 were taken up in the fall of 1897 and wintered in cellar. Root-grafts made in the winter of 1897-8 were planted at the same time in the spring of 1898. Both lots root-killed. In all hardy varieties we find the scion alive and sound but the American seedling root dead. Both Vermont apple and French crab seedlings root-killed. The Hibernal and other hardy varieties had not rooted sufficiently from the scion to carry the tree through; indeed the past winter the scion roots of all (even Hibernal and Duchess) of the cultivated varieties winter-killed. So that "trees rooting from the scion" will not be hardy enough in winters like that of 1898-9. Several hundred seedlings were grown in 1896 from seed of wild crabs gathered near Des Moines, Iowa, but all but one plant were killed the first winter.

Will the experience of the past winter change nursery methods? Probably very little except in the northern nurseries. Commercial methods change slowly, and the test winters do not come often enough to compel a quick changing. Certain it is that the western American method of root-grafting makes possible the production of apple trees at prices lower than those of Europe with cheap labor.

Let us make a flying trip to the largest empire in the world, Russia, a country containing one-seventh of the earth's surface. We will find that the growers in the northern fruit growing regions have had the same trouble with root-killing, that our tale of woe was theirs also years ago, but that they have met and solved the problem and are now masters of the situation.

In 1894 with the kindly assistance and advice of my teacher, Prof. J. L. Budd, the writer visited the Imperial Agricultural College, at Moscow, Russia, and in 1897 the visit was repeated while on a tour of exploration for Hon. James Wilson to secure new seeds and plants for the U. S. Department of Agriculture in the dry parts of eastern Russia, central Asia, China and Siberia. Prof. R. Schroeder, the venerable head of the horticultural department, has been in the government service over fifty years. He said that the Russian method of preventing the root-killing of apple trees was to use the true Siberian crab, *Pyrus baccata*, as a stock. The seedlings are transplanted into nursery rows and budded at the usual time in August. The trees make a good growth in the nursery, bear at least two years earlier in orchard, and are dwarfed somewhat in size of tree. In the southern parts of Russia, as at Kiev, where even French pears are grown, I found the nursery stocks to be mostly ordinary apple seedlings from Germany and France, as they were cheaper than apple seedlings of Russian origin, which were difficult to obtain in commercial quantities. (A similar state of affairs obtains in our eastern states, where crab seedlings imported from France, or grown from imported seed, are at times cheaper than seedlings from seed saved at our cider mills.)

Pyrus baccata is the hardiest known species of the apple and is hardy even at the agricultural experiment station at Indian Head, about 350 miles west of Winnipeg, on the Canadian Pacific Railway, where the thermometer goes down to 52 degrees or more below zero. It is found especially in the Transbaikal section of Siberia, east of Lake Baikal, where the climate is purely continental. The coldest month has a temperature of 28° C. (or —18.4° Fahrenheit,) the hottest month, 19° C. (or 66.2° Fahrenheit); difference between winter and summer temperature, 42° C. (or 75.6° Fahrenheit.) The mean annual temperature is —2¾° C. (or 27.05° Fahrenheit.) A Russian government report says: "As for the mean temperature of the vegetative period, although it is one-half degree below that of the cultivated zone of eastern Siberia, amounting to only 13.5°, yet the cereals, notwithstanding the constantly frozen soil in some places in this country at depth of 1½ arshine (42 inches), ripen well, thanks to the more powerful action of the sun's rays, depending not only on the southernly situation of the Transbaikal but also on the cloudless and transparent atmosphere, as compared with the cultivated regions of Eastern and Western Siberia.

"In reference to the amount of rainfall, the climate of Transbaikalia is also incomparably more continental than that of the agricultural zone of Eastern and Western Siberia. The quantity of moisture precipitated here in the course of the whole year does not exceed 290 millimeters (11.42 inches), instead of the 360 and 380 of the agricultural zones of Eastern and Western Siberia, while the winters are almost entirely snowless, with 13 millimeters (51 inches) during the whole season. Fortunately the summer rainfall, as much as 200 millimeters (7.87 inches), is considerably higher not only than that in Eastern but than that in Western Siberia, and the conjunction of these conditions explain the fact that the Transbaikal country may

even today be considered the chief granary of the whole Amour-Littoral region."

The above facts tend to show why *Pyrus baccata* does not root-kill in Russia, Dakota or Assiniboia.

Young seedlings of this specie raised from imported seed on the the college grounds at Brookings last year came through last winter in perfect condition.

The illustration (see frontispiece) shows a one year old tree of *Pyrus baccata odorata* whip-grafted on a piece-root of Vermont apple seedling. The seedling was grown by a western nurseryman from Vermont seed. The scion was cut from a tree imported from Germany early in the winter of 1897-98. The graft was made in the winter of 1897-98, planted in the spring of 1898 and made a growth of 17 inches the first year. Among a lot of several hundred root-grafts root-killed in the winter of 1898-99, this tree was conspicuous for its vigorous growth from the terminal end. Careful digging soon furnished the expanation. The scion, E to A, of the original graft, was alive and healthy; the root, A to B, was dead and the sap had fermented. The scion had, however, thrown out the strong root, C to D; this was perfectly healthy and enabled the root to begin a vigorous growth. The only part of the entire tree affected by the winter was the part, A to B.

In September, 1898, the writer called on Peter M. Gideon, the originator of the Wealthy and Peter apples, the Martha, Florence, Lou and October crabs, and many other varieties of apples and crabs. Mr. Gideon began his experiments in fruit culture about forty-five years ago and has grown and sent out many thousands of seedlings, chiefly of Siberian crabs. Mr. Gideon's fruit farm is situated near the shore of Lake Minnetonka, at Excelsior, Minnesota. In reply to a question, Mr. Gideon said: "If the ground is moist in the fall an ordinary apple seedling will not root-kill, if dry it will; but a Siberian crab root will come out all right and not root-kill on dry soil, while every American seedling root will winter-kill. Even a Siberian root sticking out of the ground after digging, I have known to form a terminal bud and make a tree. A mulch is always good in the fall to prevent root-killing. I have often had hardy varieties in nursery with all the American seedling root dead in the spring, but a single root which had come from the scion had survived the winter, and this pulled the tree through. We greatly need hardy stocks for the apple used in a commercial way. In my opinion, no hardier stocks could be grown than those of the iron-clad, cross-bred Siberian seedlings I have sent out."

THE PROBLEM BEFORE US.

It now remains to be settled by experiment which is the best form of the Siberian crab for this purpose. The true *Pyrus baccata* is probably the best, as *Pyrus prunifolia* appears to be a hybrid of *P. baccata* and *P. malus*, the cultivated apple, according to a recent observation of Prof. L. H. Bailey, who examined, while in Berlin, a year or so ago, the specimen in the Willdenow herbarium on which the species is founded. Fr. Th. Koeppen (St. Petersburgh, 1888,) doubts the Russian or Siberian origin of *P. prunifolia*—of this arti-

cle the writer secured a copy while in Russia. The Transcendent crab is of this type and blights badly. Seed from Siberia is not yet commercially obtainable. The old Yellow or Red Siberian, with fruit the size of a cherry or less, may prove very useful, also the old Cherry crab—old trees, forty years old or more, are found scattered through the older parts of the west. The true *P. baccata* deciduous calyx segments, that is the old sepals at the "blossom end" of the apple, fall off towards maturity. A Russian writer recommends especially *Pyrus baccata cerasiformis aurea* and *Pyrus baccata cerasiformis rubra.*

Experience has already shown that the cultivated apple makes a poor union in top-grafting upon the Siberian crab; nor will root-grafting on pieces of crab root be enough. No roots from the scion should be permitted. The stocks for a fair test should be handled much like the Mahaleb or Mazzard stocks for the cherry in the eastern nurseries, setting the stock in nursery first and afterwards, when established, budding or grafting the cultivated apples on them. It may largely do away with root-grafting in the winter and, hence, make trees more expensive, but the method is worth trying. Perhaps both hybrids and pure seedlings will be too much subject to blight for the method to be successful in all localities. But cerain it is that the present method of growing apple trees on French crab or Vermont cider apple seedlings will not do for a considerable area of the northwest in test winters.

It will take many experiments to fully settle the question. Let all who can try a few and report results.

MELONS FOR MARKET.

H. C. ELLERGODT, LANESBORO.

LOCATION AND SOIL.—While melons can be grown on almost any kind of soil, they cannot be grown successfully as a field crop unless the soil and location are favorable. Light, porous, sandy loam is the best, and it must be full of humus, or decaying vegetable matter in some form, to secure the best results. Do not be afraid of the soil being too dry or too light, but in such cases use extra care to provide an abundant supply of humus in the soil, which is most easily supplied by plowing under a good clover sod; or the field can be sown with rye in September and the whole plowed under in the spring. The melon is a lover of drouth, and while it attains a large size in a moist season or situation it will not be of as good a quality. I always raised a big crop and the best melons when the season was hot and dry. The field should be high enough to secure good drainage, and if level is the most easily cultivated and least liable to washing by heavy rains.

Melons can be successfully grown on slopes, as this not only insures a good drainage in a wet season, but the crop grown on a southern slope is materially assisted in early ripening thereby. If the land is rather wet on level soil, it can be made better for melon culture by back-furrowing a strip of land two or three rods across. This will make the land slope gradually to both sides. If the soil

is too heavy, melons can be grown successfully, for a small patch, by mixing sand in the soil in the hill, or by covering the surface of the hill before planting with about three inches of sand. Freshly broken woodland is very good for raising melons, as such soil is usually very light and full of leaf mold. I have also had great success in growing melons on land used for hog pasture, as the hogs had worked the ground well over, which made the soil loose and friable, and it was well enriched by their droppings.

MANURING.—When stable manure is used broadcast before it is well rotted it should be plowed under in the fall or early spring for best results, so that it may become well composted with the soil. I manure mostly in the hill, for a limited amount of manure will go farther that way and also give good results. Well rotted manure should be used for enriching the hills, as this tends to give the vines a strong, quick growth from the start, and it aids them in resisting the attacks of insects and ripening the crop early in the season. For very light, sandy soil I would advise using some rich manure, as of cattle, hog or poultry, for making the compost for the hills. As stated before, a good clover sod, plowed under, makes one of the best manures for the melon crop.

PREPARING FOR PLANTING.—The ground should be thoroughly prepared. Where plowed in the fall, it should be plowed again in the spring and worked fine with the harrow and roller. If not fall plowed it should be worked with a disc or common harrow until the surface is well pulverized for three or four inches. This is most important where coarse manure has been spread broadcast in the spring, for it will then be well mixed with the soil. Then plow deep and finish again with the harrow and roller. Mark both ways, seven feet apart between the rows for watermelons and three and a half by seven for muskmelons. If hill manuring is necessary, dig a hole eight inches deep and eighteen inches across for each hill and put in one or two shovelfuls of manure. Then some earth should be mixed with the manure, and the hill leveled with some fine soil so that it will be about two inches above the surface. On a large piece of ground of several acres the hills can be made more easily by plowing a deep furrow one way along the mark made by the marker. This will remove enough soil at the intersections for making the hills, if not, double furrows can be made, and, a wagon load of manure following, the amount needed for each hill is placed at each intersection of the furrow and the crossmark.

PLANTING.—For success, seed must be pure. If several varieties are planted, each kind should have an alloted strip of ground with a driveway separating it from the rest. In this way melons will be pure and not mixed as when several kinds are planted without separation. If the soil is very loose and dry, it should be packed with the foot. This is very important in a dry season, but if wet or heavy this is not necessary. Round off the hill so that it will be about a foot in diameter, then shove the spade down into the center of the hill, slanting, so that it will be about two inches beneath the surface and cover an area of eight inches by the width of a spade. Now lift out the spade with the soil upon it, scatter from a dozen to

twenty seeds over this inclined space and throw in the soil, patting it with the back of the spade. The seeds will be covered from one and a half to two inches deep. This is the best method I have ever tried for planting melon seeds, for some of the seeds are sure to grow, whether the season be wet or dry, and if the first plants are spoiled by insects, more will appear in a few days. Melon seeds should never be planted immediately after a rain, as the soil will bake and form a crust. Where it is desired to prolong the ripening season of some early melons, successive plantings should be made every two weeks until the middle of June. In some seasons this late planting will be cut off by frosts in the early fall, but, as a general rule, in two seasons out of three, it will produce a good crop.

PICKING AND MARKETING.—Watermelons should not be picked until ripe. Picking green melons is both a net loss to the grower and spoils further sales. It is better to be patient and leave the fruit on the vines until they are ripe. Let your competitor sell the green melons, and keep your reputation up for growing good, sweet-flavored and large sized melons; for then your selling is half done.

To be able to tell when a melon is ripe requires close observation and some experience. I will give some of the indications I use in telling this, but it must be borne in mind that not all of them are always present in every melon, and there is also a difference in the appearance of different varieties, and then, also, the indications may vary in different seasons. Note carefully the sound, color and stem of the melon. When struck lightly a ripe melon sounds somewhat dull, as your boot does when tapped lightly with the fingers. Another test is to press on the melon with the thumb; if it is unripe the rind will be soft, if ripe the rind will be hard. Pressing lightly with the palm of the hand is another test; if ripe it will yield slightly to the pressure and a sharp cracking of the flesh is heard. Melons turned yellow on the under side are usually ripe. When the little curl at the stem of the melon is dry, it sometimes indicate ripeness, but not always. The color of the melon should be carefully noted. When the color turns dull and roseated on the top of the melon, it is surely ripe. The color is always glossy on a green melon.

Melons should be picked in the morning when they are cool and before the sun has made them warm, for they can then be kept longer and in better condition.

In marketing melons I have found it the best method to sell to the retail dealer. If the melons are warranted to him to be good and ripe, and he can rely on the grower to replace them if green or bad, he will be a staunch friend of the grower. Always patronize home industry instead of sending your product away to some distant wholesaler, for you run the risk, after paying the freight, of getting some of your shipments classed as bad and in a long run losing a good share of your expected profits. It also gives your home dealer an opportunity to dispose of some of his goods in trade for melons, as the grower can conveniently take such goods in exchange as he has present need of. In every village or small city there are grocery-

men or restaurant-keepers who are willing to handle melons, and a good sized wagon load of watermelons and muskmelons can be divided between them once or twice each week. In this way I have disposed of the largest crop of melons I could raise, although I have grown as many as ten acres of melons in a single season.

I generally sell about one-third of my melon crop every year right at home, as a great many come to my place every day for melons, some buying for their own use, others buying them by the wagon load for retailing again among the farmers and in near-by villages or cities, and they generally make good wages for the time spent in handling them.

I have often wondered why melon raising is not a more general avocation, for melons pay better than any other farm crop, although it would not do for every farmer to raise melons extensively, for the market would then soon be glutted; but a number of farmers in most every locality would find it profitable and to their advantage to raise a patch of melons if they have a good location and the right kind of soil.

WHY SHOULD THE BASSWOOD BE UNPOPULAR?

G. W. STRAND, SEC'Y MINN. STATE FORESTRY ASSOCIATION, TAYLORS FALLS.

Tree planting is engaged in much on the same plan as clothing the body. Styles change, and people copy one another until a certain thing or variety becomes "all the rage," quite often to die out as the sight of it becomes ungainly or monotonous and then to shift into some other avenue.

A few years ago the cottonwood was enjoying the height of prosperity, now it is difficult to convince many persons that any other tree will grow except a white willow or a box elder.

The merits of a variety will always be dependent upon the personal opinion of planters, based upon their success with it in a certain locality, and the success of any particular variety stimulates its use throughout that community.

Among all the trees utilized either in timber plantations or as ornamentals, it is rarely the case that the basswood is ever thought of, although few trees in their natural state present a handsomer and more attractive appearance than this much neglected variety. There are very few places in the state where it could not be made to thrive, as it resists drouth well and is also a hardy and long-lived tree. The handsome, clean appearance of its well balanced leafy top, together with the fragrance of its numerous cream colored flowers, which supply the bees with an abundance of the highest grade of nectar, should make it a favorite among our ornamentals, saying nothing of its value as a timber tree.

The seedlings are a trifle more expensive than some of the more popular varieties, but this alone should not account for its non-favor. It is generally grown from seed, which ripens in the autumn. As the seed does not sprout very satisfactorily, this accounts for the extra cost of the seedlings. It may be sown soon after gathering or kept over winter in a stratified condition, exposed to frosts. Even

treated thus, many seeds will not sprout until spring of the second season. It can also be propagated by layers and cuttings but is rather difficult to start by the latter method. The seedlings transplant readily, but the tops are rather tender for the first couple of years.

Where larger trees are transplanted for street or ornamental purposes, the trunks should be protected for a number of years, as they are very liable to sun-scald. For timber plantings seedlings about three feet high are the most desirable.

The European species is much similar to our own, but has a smaller leaf and bark of a brownish tinge, and it is doubtful if it is as desirable a tree for this section as our native species.

Basswood is a very white, light, close-grained wood and is used considerably for interior finishing, carving work, barrel heads, and in the manufacture of cheap furniture, carriage boxes, etc., commonly sold as whitewood. A few years ago quantities were used in the manufacture of paper, but as it made a poor grade, very little is now used, spruce being the tree sought after mainly for that purpose. It furnishes a good quality of charcoal and is prized by the manufacturers of gunpowder.

The name basswood is probably derived from a corruption of the word bast—the inner bark of the tree—which is used for a variety of purposes. Before the use of raffia became popular in nursery work, this bark was used extensively in tying. In Europe considerable is still utilized in the manufacture of mats, cloth, fishing nets, etc., by the rural population.

THE IDEAL WINTER APPLE FOR THE NORTH.

CLARENCE WEDGE, ALBERT LEA.

(Read before the Southern Minnesota Horticultural Society.)

By the word "ideal" in our title we do not wish it to be inferred that we have in mind a fruit of such rare combination of superlative qualities as to make it stand only as an end to strive for, an ideal of perfection that we can never hope to attain; but it is rather our desire to place before you an apple the sum of whose qualities will satisfy the demands of our market and the reasonable desires of the home at a profit to the northern orchardist; in short, a variety that might occupy the place among us that the Baldwin does in the east or the Wine Sap in the south and west. Thanks to the persistent and heroic efforts of the generation of orchardists now about to leave us, the question of a summer and fall supply of the best of all fruits for our climate has reached a very satisfactorily solution. There will, of course, be reverses and discouragements, and we shall have to renew our orchards more frequently than is necessary in some climates more congenial to the apple, but we are proud to say that today there is no excuse except ignorance and improvidence left for the man, living on fairly elevated clay soil, within the boundaries of Minnesota, who is not enjoying an abundance of apples, from August to December, picked from his own home orchard.

So much has been accomplished, but the full season of this noble fruit has been only half bridged, and today we are face to face with the latter part of our problem: a northern apple in the cellar and on the market from December to June, or "The Ideal Winter Apple for the North."

As in all problems, much may be gained by a careful statement of their nature and conditions, so in this we shall do well to have a clear understanding of the points involved and of their relative importance; and we will, therefore, attempt to consider separately the qualities that must enter into and in varying degrees make up the sum total of this valuable new fruit.

First. Health and hardiness of tree. In this matter the Duchess is a high and satisfactory standard, and it is with real reluctance that we should accept anything that appears to fall below this mark. Still it has been well related by our friend, C. L. Watrous, of Des Moines, "It may prove far more difficult to secure late keeping hardy sorts than those of earlier season," as the early maturity of woody growth so necessary to the hardiness of a tree seems almost incompatible with the late maturity of fruit so necessary to a long keeping apple. We may, therefore, in the practical working out of this problem find it necessary to lower somewhat this high standard, and endeavor by the use of improved orchard methods, such as shade of stem and forks and, perhaps, by top-working, to make use of a variety that shall *approach* the hardiness of the Duchess, especially if it be one that fills very fully our requirements in other respects.

Second. Productiveness. Oh, for a keeper that would bear like the Longfield! If in the matter of hardiness we are willing to relax a little, here we must insist firmly for the highest possible standard, for it lies at the very foundation of the business end of the matter. Even a short lived tree may be tolerated if it is of that generous nature that begins to fill a barrel when six years planted, but we are not to be cajoled into accepting any shy or indifferent bearer under any circumstances whatever, and will only look with a degree of favor upon a tardy bearer if it ranks with those of the first degree of hardiness.

Third. The fruit must *keep*. It is only with the license born of necessity that we have been permitted to call such varieties as Wealthy, Hibernal, Longfield, Okabena, Patten's Greening and Peerless winter apples. True, with careful, special treatment, such as may be given in the home cellar for home use, any of them may be kept well into the winter, and we have seen some of them in passable condition in February, but in ordinary seasons, treated in the ordinary way, their usefulness as a commercial fruit ends some time in November and frequently earlier. We must not forget that we are after something that will have to compete with the Baldwin, Spy and Russet, something that merchants can handle without the fear of its going down on their hands, and that will endure the ordinary abuse to which apples with ordinary packing and in ordinary packages are subjected. The Malinda represents a high standard to set for this quality, and would be perfectly satisfactory to all con-

cerned. It will be best to sacrifice as little as possible on this most important point, as the demand is clear and unmistakable, from the planter to the consumer, for a variety safe and reliable in the matter of keeping.

Fourth. We must have an acid apple. There is no use talking of a sweet or half sweet fruit, for it is certain to be debarred any large place on the market. At the late meeting of the state society we asked a practical apple buyer who was present, and who has handled as many as fifty car loads in a season, in regard to the relative merits of the Malinda and Repka Malenka as market varieties, giving him good samples of each to see and taste. He assured us that he would rather attempt to sell twenty-five barrels of Repka than one of the Malinda. Although the latter were much larger and handsomer than the former, as he sampled them, the lack of acidity much more than compensated for the difference in appearance. He said that his customers always found fault if he put in more than two or three barrels of sweet apples, of even such a standard sort as the Tolman, in a car lot. If it were not for this fact we would think the Malinda approached very close to the apple we are looking for, but, as it is, this variety should only be planted for home use and select home trade, but never for the general market. Many who have never had experience in marketing apples in quantity do not appreciate the fundamental importance of this matter, and in choosing their varieties for a commercial orchard are liable to set a kind that will not meet the demands of the market.

Fifth. The fruit must be either of high color or large size, or some combination or compromise in these two matters. In this particular lies the weakness of the Repka Malenka, which in our opinion approaches the nearest to the ideal winter apple of anything now on our lists, as it combines in a high degree all the good qualities heretofore mentioned, and oftentimes colors up so as to make a very pretty appearance in the barrel, and is fully as large as that assiduously propagated *thing* called the Walbridge apple.

Sixth. Quality should be good. It is of course the ambition of us northern orchardists to excel in this particular; but, strange as it may seem, when it comes to the matter of commercial importance and profit we can afford to sacrifice more in the item of quality than in any other above mentioned. In the apple, as in the matrimonial market, beauty is always quoted high and in brisk demand, while quality alone goes begging for notice, and is finally picked up by the few knowing ones who have duly pondered the saying that "Beauty is only skin deep."

Having already exceeded the usual limits of your patience, we will bring our paper to a close by urging the general and enthusiastic attempt to produce this much needed fruit by each and all of our fraternity, never forgetting to work in line with the well established laws of nature, that "like produces like or the likeness of some ancestor." Let us choose our seed with the greatest care, introducing sufficient of our imported Russian blood to insure hardiness, and with a strong infusion of good keeping ancestry we may hope at some happy day to secure that nicely balanced product, "The Ideal Winter Apple for the North."

PRESENT STATUS OF POMOLOGY IN MINNESOTA.

J. S. HARRIS, LA CRESCENT.

(A report prepared for the American Pomological Society.

It is over forty years since the first attempts at fruit growing were made in this state. Great difficulties have been encountered, and failures without number met with. It was found, at an early day, that success could only, if ever, be assured after long and patient trial and much experimental work, and these have been made, conducted and continued with untiring perseverance by the pioneer horticulturists, aided by the experiment and trial stations, and are being crowned with a good degree of success.

The most persistent efforts have been directed to the growing of the apple. First, old and favorite varieties were tried and proved a failure, as but few of them would survive our winters long enough to produce fruit. Next, varieties of Russian origin were tried, and given a pretty thorough test, but only a very few of them have been found to possess any great merit aside from hardiness. A few only show adaptation, productiveness and quality, and the season of them is largely late summer and early autumn, and few will keep into the winter. Attention was next turned to the planting of varieties of more recent northern and western origin, and the originating of new varieties from seed, largely crosses between Siberian, Russian and the hardiest American sorts, and the result is a considerable number of great promise are found, and in alternate years fine crops of fruit are being produced. At the present time the interest in orcharding is growing, and many large plantations are being made. The crop of 1898 was very large and fine, and, in addition to named varieties, about five hundred varieties of unnamed seedlings were placed on exhibition at the state fair of that year. Of this number about twenty-five per cent were of fine size and appearance and some of them of very superior quality, and a few, apparently, very long keepers. This present season the apple crop is very light. Last year the trees were allowed to overbear, the last winter was very severe, and the present season is unfavorable on account of excessive moisture and disastrous storms, but the outlook for the future is very encouraging.

The best fruit sections, so far, are found to be the somewhat broken country extending, some forty miles wide, along the Mississippi river, up to latitude 45, the two southern tiers of counties across the state and the more elevated lands in the region generally known as the "Big Woods", west of the twin cities.

The fruits most generally grown are apples, native plums, grapes raspberries and strawberries. Apples are generally found to succeed best on clay loam or limestone soils, at an elevation of 1,000 to 1,200 feet above the sea level, and from 50 to 400 feet above valleys along rivers and streams or smaller water courses; but some very good orchards are found in the broader valleys. The native plum succeeds almost everywhere. Grapes generally do the best on southern slopes of bluffs and southern shores of lakes, in a sandy loam soil, at an elevation of 50 to 200 feet above the water level of

the rivers and lakes. All varieties as early as the Concord usually produce good crops of excellent fruit that ripens before the autumn frosts.

Strawberries and raspberries succeed remarkably well over a large portion of the state, and are being grown extensively in many localities for commercial purposes, but in most sections the raspberries require being laid down and given some winter protection. Blackberries have been planted quite extensively in the southeastern part of the state, but are not found very profitable and are losing favor.

Pears and domestic plums have not, so far, been produced with any encouraging degree of success. The difficulty with pears seems to arise from blight, the trees seldom living to reach a bearing age, and those that do perishing after producing the first or second crop. The Russian varieties endure little, if any, better than the others. With the domestic plum the difficulty appears to be from a lack of hardiness.

In the southeastern part of the state a few varieties of the sour, or pie, cherry are succeeding very well, but the fruit buds were injured by the cold of last winter.

Varieties of greatest value for general cultivation and so recommended are marked by one or more *, or for trial by this mark †.

Apples now in catalogue (P. malus): Antonovka *, Borovinka **, Gideon *, Gravenstine (Russian) *, Hibernal **, Longfield **, McMahon *, Northwestern Greening *, Oldenburg (Duchess of) **, Peach (Montreal) **, Switzer —, Tetofsky **, Wealthy **, Wolf River, *, Yellow Transparent *.

Crabs or Siberian Hybrids. Beecher **, Briar **, Gibb *, Hyslop **, Martha *, Minnesota **, Orange *, Transcendent *, Whitney No. 20 *.

Apples not in list or catalogue.

	Size.	Form.	Color.	Fl'vor.	Qu'l.	S'sn.	Use.	Or'gin	
Charlamoff	5-6	r. c.	y. r. s.	m	good	e. m.	d. m.	Rus.	* *
Malinda	5	r. c.	g. y.	sweet	5	l. w.	k. m.	Vt.	*
Okabena	5-6	r. ob.	r. s.	m	6	m.	k. m.	Minn.	*
Patten's Greening	6-7	r. ob.	y. l.	m	6	m.	k. m.	Wis.	* *
Peter	5-6	r	r.	m	8	m. l.	k. m.	Minn.	*
Peerless	6-7	r. c.	r. s.	m	7	m.	k. m.	Minn.	†

Blackberries. Briton **, Snyder **.

Cherries. Bessarabian †, Dyehouse †, Montmorency †, Morello **, Richmond **.

Currants. Prince Albert **, Holland Long Bunch **, Red Dutch Improved **, Versailles *, Victoria **, White Dutch *, White Grape **, Wilder †.

Gooseberries. Downing **, Houghton **, Pearl †, Red Jacket *.

Grapes. Agawam *, Barry *, Brighton **, Champion *, Concord **, Cottage *, Diamond *, Janesville *, Martha *, Moore's Early **, Niagara **, Pocklington *, Prentiss *, Early Victor *, Winchell *, Woodruff †, Worden **, Campbell Early †.

Plums (P. Americana). Cheney *, De Soto **, Forest Garden **, Hawkeye *, Rockford *, Rollingstone **, Weaver *, Wolf *, Wyant **.

Raspberries. Columbian †, Shaffer *.

Doolittle *, Eureka †, Gregg *, Kansas *, Nemaha **, Ohio *, Older **, Palmer *, Souhegan *.

Brandywine *, Cuthbert **, Loudon **, Marlboro *, Turner *.

Strawberries. Bubach No. 5 *, Crawford *, Crescent **, Cumberland *, Downing *, Enhance *, Gandy *, Greenville *, Haverland *, Jessie *, Michel's Early *, Van Deman *, Warfield **, Wood (Beder) **, Wilson *, Woolverton *, Clyde †, Glen Mary †, Splendid **, Lovett *.

A considerable number of seedlings and little known varieties of apples have been looked up and reported to the State Horticultural Society, but we have not had opportunity to observe their condition since passing through the last hard winter.

"DONT'S" FOR BEGINNERS.

C. MORGAN, FORESTVILLE.

(Southern Minnesota Horticultural Society.)

In the first place I would say to all those who are thinking of setting an orchard or growing fruit of any kind, "don't" forget to attend any and all horticultural meetings that it is possible for you to attend, so that when you are ready to get your trees you will have learned in regard to the kinds best suited to our climate and soil which are now grown by nurserymen.

"Don't" put your money into apple trees or any other kinds of fruit plants with the expectation of growing apples or other fruit, until you have made up your mind that you will first take good care of them after you get them; otherwise it will result in disappointment to yourself as well as in an injury to the nurseryman of whom you got your trees or plants. All nurserymen are much interested in having the trees and plants which they send out do well, so that those who get their stock of them will feel that they have not been swindled out of their money and time. "Don't" forget that your success in the growing depends in a great measure on yourself. Careless handling of trees or other fruits, evergreens, etc., after you get them home, is not the thing you should do if you expect success.

"Don't" go to the nursery or place of delivery, lose valuable time in going, and then after you have carefully selected the kinds you want and satisfied yourself that the trees or other stock which you had bought were in a good, thrifty condition, start for home with the roots exposed to the hot sun and dry winds and leave them so exposed until you have time to set them out. "Don't" do that way with your nursery stock, although it is the way in which many people handle their trees and other plants, and then blame and abuse the nurseryman because they did not all live and do well.

"Don't" select your poorest land on which to set your trees. "Don't" think for a moment that some old worn out hillside is good enough for trees. If the land on which you wish to set your trees is not rich enough, make it so as soon as you can after setting them out.

"Don't" set your tree before you dig the hole, or, in other words, "don't" take your spade in one hand and your tree in the other,

start out in the sunshine, and then allow the tree to be exposed to the weather until you dig the hole. Dig the hole before you remove the tree from the place where you should have it carefully covered.

"Don't" dig the hole for your trees like a small post hole, as many do; but dig a hole not less than three feet in diameter and two feet deep and fill in with good surface soil until it leaves the tree when set about four inches deeper than it stood in the nursery. Have the hole fuller in the center than outside, that the roots can have their natural incline downward.

"Don't" cover the top roots and under roots all at one time, as if you were planting some old broom, but carefully cover the under-roots first and press well the soil around them; then comb out with your fingers the top roots, cover well until you have the hole about one-half full; then get in and tramp the soil as solid as possible, and keeping the tree straight up and down while tramping; leave about an inch of loose soil on top. "Don't" fill the hole quite full with soil but put on your mulching of old straw or manure. To the old man I would say, "don't" set the boys to do the setting out, but look after that matter yourself. It will pay you.

"Don't" cut the roots off, in order to save digging the hole a little longer. It wont pay.

"Don't" abuse the nurseryman, if your trees have not done well, if you failed to do well your part. "Don't" plant your trees and then allow the grass and weeds to take possession of your orchard, and should any of them die "don't" make the argument, as some do, that it was necessary in order to shade the trees and keep the ground from drying out. Mulch well your trees as soon as set; that will help hold the moisture at the time the tree needs it most. "Don't" put it off for two or three years before you do it, and then wonder why it is that your trees do not look as thrifty as those of your neighbor, who did his work right at the proper time. Recollect that a tree half planted is money and time thrown away.

"Don't" be afraid to get down on your knees on such occasions, if at no other time. "Don't" be afraid of mother earth. "Don't" think it will result in a run of fever, if you do get a little dirt under your finger nails. Better borrow an old pair of pants from your less pretentious neighbor than not do well your work.

I will suppose that some of you have done all that is necessary to raise an orchard; that the trees are all growing nicely, looking thrifty and healthy, no blight or other trouble among them; that they are getting to be quite large trees. "But," say you, "Why don't my trees bear apples?" You think that they are large enough, much larger than your neighbor's trees that were set at the same time, but his trees have been in bearing two or three years. You can see that his trees look rather sickly and that some are dead, yet, as he is getting apples and you none, you conclude that there is something wrong somewhere and that you have been swindled again by some villainous nurseryman by selling you trees that do nothing but grow. You conclude that you will stand this condition of things no longer; that you must have apples and that right away; that you have waited long enough for fruit—a bad condition of things, to be

sure. But the good wife, as luck will have it, always comes to the aid of her stupid better half when some deep problem is to be solved. She tells you if you had read the horticultural reports as closely as she had, you would have known just what to do when trees acted in that way. She says that she has read an article in one of the reports written by one of the wise ones on tree culture, who lives up north somewhere, that, when trees were doing well and growing too much to wood and not forming fruit buds, the thing to do in order to make the fruit buds start at once, even in winter, would be for you to take your buck saw, or any other kind of saw, and go prancing around your trees while you saw a spiral column around the tree from the ground up the tree as far as you want buds to grow. He says, if you treat your trees to a dose of buck saw about the middle of June, that you will be sure to have plenty of fruit the following year, provided the trees live through the operation. I would say to those who have nice growing orchards, "don't" be discouraged if your trees are growing nicely, even if they don't bear as soon as you would like.

"Don't" you believe all that agents tell you regarding the wonderful and superior fruits that they have to sell.

I learn through the papers that already Queen Lill and Grover Cleveland have formed a co-partnership and intend going into the nursery business on a large scale, with a view to monopolize the trade; will probably flood the country with their agents, selling all kinds of tropical fruits; will no doubt make some believe that the orange and banana can stand our Minnesota winters just as well as a Soulard crab. Now, I say "don't" buy of those fellows as you often do. But you go to the nearest nursery for your trees, wherever you live, if such kinds as you want can be had there.

"Don't" go growling and faultfinding among your neighbors, telling them that a certain nurseryman failed to do as he agreed before the time agreed upon had expired for him to make good his agreement, especially those that never buy trees of any nursery. There is no nurseryman so stupid but what knows that his success in business depends on fair dealing. If you have any fault to find, present your case to the nurseryman of whom you got your stock. He will be glad to right all wrongs as far as it is possible for him to do.

LEGAL SMALL FRUIT PACKAGES.—A new law prescribing dimensions has been placed on the statute books in N. Y. This provides that the standard of measurement for buying and selling strawberries and other small fruits shall be the quart, to contain when even full 67 cu. in; the pint 33½, and the half-pint 16¾ cu. in. All manufacturers of small fruit packages less than the capacity indicated must plainly mark upon each one the word "short." Infractions of the law requiring the observance of these specifications to be subject to a fine of $5 to $25. The new law takes effect January 1, 1900.

HOW TO PLANT AN APPLE TREE.

(Southern Minnesota Horticultural Society.)

(First Prize Essay.)

IRENE E. WARREN, SPRING VALLEY.

In planting apple trees great care must be taken in selecting the location for the tree. A northern slope, previously used for a garden is preferable. The ends of all roots which have been wounded in being removed from the nursery should be cut off slantingly, so that the roots can sprout out evenly.

In a hole somewhat larger than is necessary to accommodate the roots, sprinkle the upper soil to the depth of a few inches and pour in a pailful of water. After straightening all roots, place the tree in the hole so that it slants toward the southwest, in order to protect it from the winds which are prevalent from that direction, and in order that the foliage of the tree and the northern slope may protect the trunk and tender buds from the sun until the sap flows freely and the tree is stronger, when it will straighten of its own accord.

Pack the earth firmly about the roots, until it comes within a few inches of the top of the ground, then sprinkle the dirt loosely to prevent the earth from hardening after a rain and also to keep the dirt about the roots moist.

Mulch the tree thoroughly with leaf mould.

HOW TO PLANT AN APPLE TREE.

(Southern Minnesota Horticultural Society.)

(Second Prize Essay.)

ROBERT WEDGE, AGE 16, ALBERT LEA.

Plant an apple tree on high ground. I saw some apple trees doing well on the top of a bluff near the Root river. Prepare the ground and dig a hole according to the size of the tree before taking the tree from the bale. Be sure and not let the roots be exposed.

It is a good plan to cut off the ends of the large roots so as to make fibrous roots come out.

If the tree has a long tap root, going straight down, cut some of it off to save labor in digging the hole. Dip the tree in mud before setting. Lean the tree towards the one o'clock sun, and in five years you will find the trees straight or even leaning towards the north.

Put in moist dirt next to the roots and pack it solid. Put in a little more dirt and pack it down, and so on until you have filled the hole.

After setting, trim in the longest branches and trim off the needless ones.

The best time to plant apple trees in our dry northwestern climate is in the spring.

SUNSHINE AND FLOWERS AS FRIENDS OF THE "SHUT-INS."

MRS. JONATHAN FREEMAN, AUSTIN.

(Southern Minnesota Horticultural Society.)

The other day I was reading a description of the imprisonment of the French exile, Dreyfus. He is confined in an iron hut on a pestilential island; this hut is surrounded by a palisade so high that he cannot see the ocean near by. In his one living room is an iron cage, in which a sentry constantly sits, watching him. What little food is furnished him, he must prepare himself, and at night he is chained to his bed. No word is spoken to him, and he is condemned to perpetual silence. Such severity cannot be justified by his sentence. The life of a person so "shut-in" must be *horrible* in the extreme. The sunshine of love and the sweet-springing flowers of hope are denied him. There seems to be no relief for him but death.

Let us turn from this sad picture, to the cheerful, sunny life of our cherished "shut-ins."

There is scarcely a family but what contains an invalid. Sometimes the dear one is shut in for only a few weeks. Then it is a pleasure to surround the friend with all the comforts and pleasures attainable. But if the imprisonment is prolonged for months and even years, then the old time service of pleasure becomes a duty, and you soon see plainly what path of work God has marked out for you. The life of a "shut-in," even at its best, is dull and featureless compared with yours. There are days of suffering and pain, days of weakness and weariness, days of nervousness and depression that must be lived through and endured patiently or impatiently, according to the disposition and disease of the patient. You tire of the exacting demands and many idiosyncracies. You think if it were *you*, you would be less selfish, less tiresome. Ah! indeed, if it *were* you! Think what it would be like, to be shut in from all church and lecture-room privileges; shut in from social pleasures; shut in from helping others; from caring for the sick and dying, the poor and destitute; from accomplishing philanthropic work. You would be "laid upon the shelf," shut in by the "four walls of home." At least, do what you can in a common sense way for these unfortunate sufferers. It is not necessary to hazard your own health to minister to every whim, but you are fortunate if you can give them in great abundance God's free gift to mankind, the blessed, life-giving sunshine. Roll up the curtains and let in the flood of light. It will chase away the "blues," destroy the germs of disease and, maybe, prove a cure-all where medicine has failed.

The sweet, fragrant flowers, the "stars of the earth," are another important source of comfort to our dear "shut-ins." In our great city hospitals the inmates are often gladdened by visits from representatives of floral organizations, whose pleasure it is to cheer the heavy hearts and shorten the long hours of the sufferers by gifts of simple, lovely flowers.

Once I remember being in a large department store in one of our growing cities, one day in early spring. A premium had been

offered to the boy or girl under a certain age who would bring there, on a certain day, the finest collection of wild flowers. This happened to be the day, and such an array as was presented, the children, as well as the flowers, attracting much attention. Directly the prize was awarded, I heard the proprietor order the flowers sent to a certain hospital, and as the children filed out each was given a little memento, as a keepsake.

Personally I do not care to see a living room in our homes turned into a conservatory. I am too jealous of the beneficial effects of the healing sunshine to ourselves and our children to fill each and every window so full of plants that one can scarcely see out of doors. Let there be a few favorites on brackets on either side of a south window. Let vines run over the top, with perhaps a hanging-basket in the center, if the window is large enough. You will get a pretty view of the out-door snow scene. In the summer, have all of the flowers that you can attend to, on the porches, on balconies, in window-boxes, in symmetrical beds and, failing in these, put them in your vegetable garden; give them even no more care than the vegetables receive, and you will be well repaid by quantities of flowers for in-door ornament.

Let me give you a bit of personal experience: Last summer we were building a new house, and there was no place to raise flowers near the house or in the door-yard. But my daughter said she *must* have flowers *somewhere*, so she sowed the seed in the vegetable garden, gave it the little care and attention that she stole from her many arduous duties, and the comfort those flowers gave our home invalid was inestimable. The routine of the daily trip to the garden for the dinner was enlivened by the picking of huge handfuls of sweet peas, that made our home rich with dainty fragrance.

Just the other day I received a Christmas letter from an invalid sister. In it were leaves from a rose geranium in her own home, as fresh as when picked, although a thousand miles away. Surely the giving and receiving of so fragrant a momento was a rare pleasure.

If your invalid friend is physically able, then let her wait on and do for herself all that is possible. It were better to tire ourself physically than to feel that one is useless and forever shelved from life's greatest happiness, that of doing for others.

The entertaining of some hobby has carried many an invalid past the shoals of despondency and despair, and has, at last, anchored the poor, pain-racked body in a haven of rest and health.

Now, lest you think me visionary and impracticable, let me show you the sitting room of one of the "shut-ins." There are many home-like beauties about the room, but first is the flood of sunshine that permeates every corner. There are these southern windows side by side, another window to the east, and still another window facing the west. The sun looks in from sunrise to sunset, and the moon, too, is a picture of beauty in the clear nights. There are books, magazines, news and literary papers of all kinds in great profusion. In one corner of the room stands a piano, and there is at least *one* "shut-in," who, although her life holds many days of

suffering, daily thanks God that her "life has fallen in pleasant places."

"I know not what the future hath
Of marvel or surprise,
Assured alone that life and death
His mercy underlies.

And if my heart and flesh are weak
To bear an untried pain,
The bruised reed He will not break,
But strengthen and sustain." (Whittier.)

MISSOURI BOTANICAL GARDEN.

PROF. H. C. IRISH.

(Read before the Missouri State Horticultural Society.)

This garden was founded and endowed by Henry Shaw and holds a unique place among American institutions of learning. First, improvements were made by Mr. Shaw for his home, a few acres only being improved and beautified for his own pleasure. As these acres grew more attractive, the public took so much interest in the place that, about 1858, Mr. Shaw decided to convert them into a scientific institution. About the same time he secured from the state legislature an act enabling him to place the garden under the management of a board of trustees. From this time the garden made a systematic and steady advancement under the direct supervision of the founder until the time of his death. In 1866 Mr. Shaw established a park adjacent to the garden, which he deeded to the city on condition that a certain sum of money be given annually for improvement and maintenance. This covered a tract of 300 acres—what is now known as Tower Grove Park. In 1883 Mr. Shaw established a school of botany as a department of Washington University.

Mr. Shaw died in 1889 and left most of his estate, appraised at one and a third million dollars, as an endowment of the garden, mostly in real estate. There are fifteen trustees who perform their duties without compensation. Gardening operations are in immediate charge of a director, assisted by a head gardener, botanical and horticultural assistant. The garden proper contains forty-five acres, divided into decorative portion, arboretum, fruiticetum and vegetable gardening. Among the many features is what is known as "Grandmother's Garden"—a collection of many of the hardy, old-fashioned plants; also ponds in which water plants are grown, and several rockeries.

By direction of Mr. Shaw's will six scholarships were established by the trustees, and, at first, a course of study arranged for six years, afterwards changed to four. Each student has a cash allowance of $200 the first year, $250 the second year and $300 for each succeeding year. One position is filled by the nominee of the Missouri State Horticultural Society, one of the St. Louis Florists' Club, and the remaining four by competitive examination. All must be young men between the ages of fourteen and twenty years of age, of good character and possess at least a good elementary English education. The regular course of study requires nine or ten hours of manual

work each day for the first year, and during last three years five hours per day in general gardening under the head gardener. The pupil is transferred to various departments, according to merit, and thus becomes familiar with all branches of the work. The balance of the time, or one-half of each day during the last three years, is given to horticultural instruction, lectures, courses of reading, field observations, etc. The course covers 924 exercises for each student —floriculture, vegetable gardening, fruit culture, forestry, landscape gardening, surveying and drainage, bookkeeping, economic entomology, general botany, botany of decorative plants, hardy wood plants, fruits, vegetables and weeds, economic mycology, vegetable physiology and special thesis work. Nineteen students have been admitted to the scholarship course since its inauguration in 1890.

In addition to these garden scholarships, any suitably prepared pupil, lady or gentleman, may be admitted as a tuition student and is entitled to the same certificate as a scholarship pupil on completion of the prescribed course and examinations. Four students have been admitted under these conditions. The aim is to teach the principles and the actual practice of budding, grafting, pruning, propagating, etc., of as large a variety of important plants as possible. In addition, any horticulturist or botanist may have free use of the facilities the garden has for advanced study. Many have taken advantage of these opportunities. From actual count of visitors passing through the gates each day for the past few months, it is estimated that from 100,000 to 150,000 people visit this place during a year.—(Wisconsin Horticulturist.)

GLADIOLUS CULTURE.

MISS CLARA E. SALTER, VICTORIA.

The gladiolus we consider the most beautiful and, at the same time, the easiest raised of all tender bulbs. By tender bulbs we mean those bulbs that have to be taken up and housed over winter. Last summer we had in bloom one hundred bulbs, and thirteen different varieties. This is the collection of years, for we have been a gladiolus "crank" for many years. We have all shades of pink, red, orange, cream and pure white, although white is the most difficult to raise.

In the fall, after quite a hard frost, we take a fine, dry, warm afternoon and arm ourselves with a sharp spade and dig up our gladiolus bulbs. Be sure not to injure any of the bulbs. Take them and shake all the earth off and cut the tops off about two inches above the bulbs, with a sharp knife. Then take a box, put in a layer of dry clean sand, then a layer of bulbs, and so on until your bulbs are all packed. On the top put about two inches of sand. Then I bid my bulbs a long good-bye and put them to rest under the cellar stairs. But the cellar most be dark and frost proof.

The first fine weather in May I set out my bulbs. The most of them will be sprouted, but that does no harm—does not injure the sprouts. The larger the sprouts, the sooner the gladioli will be up. I plant them out in the vegetable garden, for you cannot raise

gladioli successfully and crowd them. That is one thing to be remembered. I plant in rows four feet a part, and ten inches apart in the rows, setting about two inches deep.

What a joy when in about ten days the first tinge of green shoot peeps out! Some may not come up for weeks, but just have patience, and they will all come up if the bulbs are sound. My experience has been that if a bulb doesn't look perfectly healthy, it doesn't pay to plant it; it will only be a puny plant all summer and die when the heat of August comes. The terrible heat of last summer destroyed some of my choicest bulbs. Some small worm will also get at the roots sometimes and kill a plant, but not often. Cut worms have cut some for me, but very seldom, and cut worms are easily destroyed before they have done much damage. But the gladiolus is free from all destructive flies, bugs, spiders, etc.

I cultivate with a horse and a common garden cultivator, and hoe them often. I plant the bulbs all at one time, but they will not begin to put out their spikes at once; so I have a succession of bloom for weeks and weeks. Mine begin to blossom the last week in July and keep up until killed by the frost. Some of the spikes on mine, last summer, were eighteen inches long, but, then, I have the heaviest soil and fertilize besides, with barnyard manure. The manure must be free from straw, or the heat will kill the plants. Use no manure of a heating nature; rather use none.

Now I will tell you how to increase your stock of bulbs. Last summer I had one hundred flowering bulbs, but more than two hundred little ones,some of which will blossom this year, and some won't. A bulb that has been blossoming once will never blossom again, but instead several new bulbs are formed close around it,and they are the ones which will blossom the following year. So there is an increase of blossoming bulbs of, perhaps, sometimes two, four or six, sometimes even more than that. I always leave the old bulb attached until spring, when I set them out.

So much for the flowering bulbs. Now for new bulbs which are not ready to flower for a year or two. There are attached to all gladiolus bulbs when you take them up numerous small bulbs in size from a pin head to a pea. These you want to leave attached until spring, when you separate them and plant them by themselves. Some of the larger ones will blossom, perhaps, the first summer, but that won't happen often. Tend them carefully, and by fall most of them will be fine, robust bulbs, ready for fine bloom by the next summer. Gladioli can also be raised from seed, but I have never tried it.

In my opinion there are few flowers to compare, in beauty in the garden and also for cut flowers, with the gladiolus. All labor expended on them will be more than repaid, if a person is a lover of the beautiful.

LARGE POTATOES BEST FOR SEED.—In some German experiments to test the desirability of large, small and medium tubers for seed, it was shown that large tubers gave decidely the best yield.

SHELTER BELTS.

A. NORBY, MADISON, S. D.

(Read before South Dakota Horticultural Society at Yankton, Dec. 13, 1898.)

Effective and lasting windbreaks can be had by thickly planting ash, elm, box elder, wild black cherry and other hardy species mixed. The ash is the most reliable but does much better when growing among other kinds, especially such as leaf out early in the spring and shade the ground quickly. When only a narrow strip is planted, a thick row of willows (laurel-leaf is the best) some distance outside is necessary to stop most of the drifting snow. Mistakes are often made in planting too closely to the buildings.

About the value of shelter belts to the farmer, stockman, fruit-grower, yes, every inhabitant of the plains, I scarcely need mention. Anybody that has come under the shelter of a grove on a stormy day knows it. But the ideal shelter belts are long and tall rows of evergreens. A home surrounded by such a protection is an attractive and beautiful landmark on the prairie, and makes our very hearts feel warm whenever observed. Yet the planting of evergreens for shelter has hardly commenced in our state. The reason mainly is that extremely few believe that they will grow and thrive in South Dakota, because so many attempts have resulted in failures. The causes are several and not hard to explain, such as planting varieties not at all suited to our climate, buying forest-pulled trees or over-crowded and not properly handled trees from the nurseries, long transportation and handling by inexperienced men, and, last, but not least, planting in the prairie or sod in front of the dwelling. Norway spruce, arbor vitae, red and white pines are not adapted to this part of the state, at least, and should not be used in planting either for ornament or shelter, when we have so many excellent varieties doing well here. The red cedar is right at home with us when raised from seed grown in the northwest; it stands more drouth than any other evergreen, grows about as fast as the spruce and is admirably suited for shelter. It must be often transplanted or root-pruned to move safely. If small plants or trees are used, a little protection may be necessary during the first winter. Scotch pine stands quite well and grows fast when established, but are not expected to live as long or look as well when old as others recommended; still it is very valuable for windbreaks. The jack pine (Pinus Banksiana) is promising, being very hardy and a rapid grower, at least while young. It also stands drouth remarkably well.

And then we have our own tree, the Black Hills pine, or bull pine, (Pinus ponderosa). It not only grows naturally in the "Hills," but is found east of the Rosebud Agency and in northwest Nebraska. This pine is unapproached as a drouth-resisting evergreen. Here it keeps pace with the Scotch in growth, is a prettier tree and may be expected to live for a hundred years, at least. It is very hard to transplant unless frequently moved or root-pruned. The white spruce is hardy, transplants easily, is a nice ornamental tree and makes a good shelter. The Black Hills spruce is hardy, transplants

easily, is a nice ornamental tree and makes a good shelter. The Black Hills spruce is still hardier and tougher in every way, but so far has proved a slow grower with me. But my decided choice among spruces is the Colorado blue. It is not only the hardiest but also the most beautiful of all evergreens in my collection; it stands without a blemish, that is, good specimens raised from plants gathered on this slope of the mountains in Colorado; as grown from seed in the eastern nurseries it is not as hardy nor as nice. This tree will make a most perfect shelter. It is very easy to transplant and seems remarkably well adapted to our needs.

Instead of buying four large evergreens to set in the sod in the front yard, get a hundred or more stocky transplanted trees, twelve to eighteen inches high, and plant only on soil and site where you would expect to raise a good crop of corn—of course, you want them where they will do the most good when grown up. Manure should not come in contact with the roots. Plant firmly, cultivate thoroughly, and don't doubt for a moment that you will have the finest and best shelter belt in the state.

A VEGETABLE GARDEN FOR A VILLAGE LOT.

E. A. CUZNER, MINNEAPOLIS.

First on the list of early vegetables comes asparagus. I plant mine twelve inches from row to row, and ten inches from plant to plant in the rows, and six inches deep, omitting every fifth row. This gives room to cut the crop easily, and this space can be used for a few summer lettuce or cauliflower. A thin crop of radish can be grown on the asparagus beds without doing any harm.

The Egyptian onion is one of the few things that can stand our long, cold winters, and the top sets planted in the fall make a very fair onion for early spring. I put mine twelve inches from row to row, putting the sets about two inches apart, and leaving a permanent bed in some corner for sets.

Rhubarb should be in every garden, but be careful and get some good sorts. Victoria and Linnaeus have been as good as any for general use. Mine is near the fence, where it will take half its food from the street.

I like to lay my ground off in plats about one rod in width, with alleys about eighteen inches wide. A few rows of early potatoes are always acceptable. After potatoes a crop of turnips may be had. After laying off my ground for tomatoes, it is then cropped between the rows with spinach or early beans. By growing corn next to my squash, the vines can use the same ground to advantage. A few early peas on the other side will also give room for the vines. Late corn I once planted in with early cabbage, leaving single stalks eight feet apart. The cabbage seemed to do as well as it would alone. The ground had been well manured. Then comes onions from seeds, and beets, salsify, carrots, parsnips, lettuce, sage, parsley, summer savory, kohl rabi, cucumbers and celery.

My tender plants are started near where they are intended to be used. The kitchen stove and window is brought into use, sowing my

seed in rows in flat boxes, about three inches deep, and transplanting as early as the various plants can be handled. This will save a couple of weeks. If you are like myself and cannot get home in time to make a hot bed, then do the next best thing: take your sash into some sheltered and south exposure. I generally get mine out in such a place about the second week in April. Tomatoes which have been in boxes can be put out in good weather—and do not forget a hill or two of the vegetable marrow (one of the summer squashes.) They come useful in summer and winter as a vegetable, also for pies in fall and winter. We keep them as late as March, though, like all squash, they should be kept warm. My currants, raspberries and strawberries are as near the house as possible. Grape vines may be used for shade against the house. I have only one vine as yet, but it has done well enough to assure me that they may be grown to advantage. To say nothing of the shade, we had sixteen good bunches of fruit last summer. It was an old vine given me two summers ago. It has a southwest exposure. Mine is tied up to screw eyes. They may be grown to advantage even in the city suburbs. It is a very good way to fasten some wire netting against the house, strongly, say to ten feet from the ground, putting posts three feet from the house about eighteen to twenty inches high. The fruit can then be seen from the windows.

Do not forget a few flowers, some strong growing varieties, such as candytuft, batcheler's buttons, calendula, African marigold, zinnea, coreopsis and the many others you may like. These may be planted along the alleyways or walks. A few double flowering poppies sown among the vegetables will not harm anything, and they are very attractive. These are not intended to do away with the flower garden, but simply to make the vegetable plat a little brighter.

It may not be out of place to say that I find it pays me to bestow an extra amount of care on about one-half doz. tomato plants for early fruits. After they get to be good plants in the flats I pick out six of the best, planting them in little crates made out of lath or strips of board, leaving spaces of one-half inch between each slat. Line it with coarse manure or hay to hold in the earth. Mine are about eight inches square. By planting time they will be well set with fruit. Of course, they are not as sturdy from the crates when planted out, but keep well staked, tied and pruned.

FIGHTING THE SPRING CANKER WORM.—There are two principal methods of holding this insect in check, according to the New York experiment station. The first is directed against the insect in the adult stage and consists in placing mechanical obstructions, such as bands of tarred cloth, around the trunk of the tree to prevent the females, which are wingless, from ascending the tree and depositing their eggs. The second consists of fighting the larvæ by spraying with arsenical poison. Although good results have been obtained by the first method, it has been pretty clearly shown that this cannot be depended upon to rid an orchard of the pests. Spraying is, therefore, of much importance in checking depredations of these insects. For this purpose Paris green and green arsenite or arsenite of lime answer.

SMALL FRUITS.

EDWARD D. GRAY, YANKTON, S. D.

(Read before the South Dakota State Horticultural Society meeting.)

The growing of small fruits in South Dakota is not an easy, nor is it an impossible, undertaking. We have disadvantages of climate conditions which do not face the berry grower in Illinois, southern Iowa and sections of the country where the winters are less severe and the summer atmosphere is less withering with its dry winds. That our soil is rich and well adapted to fruit culture we all believe. That we have an admirable market for any and all of our fruit products goes without saying, with a good soil and plenty of water, for we can irrigate. With a ready and good market at good prices, can we raise small fruits profitably in South Dakota? I believe we can, at least, in the southern central parts. We have, however, to face three dangers which threaten small fruits, namely: the extreme cold of winter, late spring frosts and hot, dry south winds. To this might be added drouth, but for that we have a remedy in artesian or some other form of irrigation, which I believe to be absolutely essential to successful fruit culture.

First.—As to our winters. It has been demonstrated that the blackberry, red and black raspberry very seldom or never will outlive the South Dakota winter. If they do, their productiveness is much impaired. Some kind of protection is essential; what it shall be depends upon circumstances. I have known the Cuthbert red raspberry survive the winter and produce a large crop without other protection than the fact that it grew in an orchard surrounded by shrubbery. Some winters straw might be sufficient protection for the blackcap. However, the only safe method of winter protection is earth covering. It is absolutely sure and takes away all danger of winter-killing. It is laborious and expensive, to be sure, yet in the light of the value of the crop this will be insignificant.

Second.—Far more serious is the danger which threatens the plantation in late spring and early summer, when the bushes are in blossom. Our frosts are as uncertain and erratic as our blizzards. How to protect the delicate flowers, even though warned in good time by the weather bureau and one's own foresight, is a serious question. We all know that a copious irrigation, a constantly descending spray, a dense smoke or a covering of more material kind are used with good success. Whether they are practical for you and me is a question we must decide, and yet some method must be used if the crop would be saved. Two out of four, if not three out of five, years we suffer from late frosts. If we can guard against these, the crop will be practically insured—no, not insured for in the third place we have that bane of South Dakota, the withering summer south wind, which comes from over the Nebraska sand hills and costs the farmer thousands of dollars every year in a shrunken wheat crop, and makes life a burden to all living kind. With this we must take our chances. Even if the roots have sufficient moisture, the shrivelling of the berry will not be checked. Windbreaks may be a help, but they cannot shut out the burning heat from the furnace blast. Small fruit to reach its perfection in size and juiciness requires, with other

conditions, a moist atmosphere; especially is this true of the blackberry. It is the lack of this condition of atmosphere at the season when needed that makes it doubtful if South Dakota will ever be the natural home of the small fruits. I do not wish to be thought an unbeliever in small fruits in South Dakota, nor unloyal to the best interests of our state, as the real estate man would count one who did not always paint our possibilities and capabilities in the most roseate hues. I believe, as I said in the beginning, that small fruits can be profitably raised in this state. We have advantages which offset in a measure the disadvantages. The larger profit we get from what we do grow enables us to take a risk and bear the added expense our locality forces upon us.

My thoughts in the foregoing have been chiefly upon the fruits which are borne on canes or vines, such as the raspberry, blackberry, dewberry and grape. The strawberry, although exempt from winter-killing suffers, with them, from the frost and heat. The strawberry I believe to be a safer investment than any of the other fruits named, for the reason that its season of ripening is fully three weeks or a month earlier. We do not, as a rule, suffer from the south winds until the latter part of June or the early July days. The strawberry is the king of small fruits, and the man that can raise this delicious berry on the South Dakota plains is sure of a place in the affections of the people. As to varieties, I cannot speak with much authority, for my experience has been necessarily limited. We must turn to the heads which have grown gray in fruit culture on the western prairies. My own selection, if I should be asked to make one, for this locality would be as follows: For strawberries, the Warfield fertilized by the Bederwood. You will make no mistake if you plant these two varieties. To them might be added the Crescent, Wilson, Meek's Early and Jessie. We are now testing about fifteen different varieties, but would not venture an opinion on them at present.

For red raspberries I would recommend the Cuthbert, Sodem (?) and Shaffer. Have tried others but have not succeeded with them. For blackcaps the Gregg, Older and Kansas are No. 1. We have limited our culture to the two first, which are large and delicious. In the blackberry line nothing can approach the old Snyder. We have tried the Ancient Briton, highly spoken of in Wisconsin and other varieties, but they did not compare with the Snyder.

Any of the above varieties I would recommend for this climate and soil and at the same time would earnestly advise no one to sink money in untried fruits. Why not profit by the experience of others? We all know how alluring are pictures and the praises sung of some new and remarkable variety that almost every seed house or fruit grower has discovered or put out as a leader. If any variety has intrinsic value it will soon show it by its general acceptance and by becoming a "good old variety."

You ask what about the hardiness of the above fruits? They are not hardy. There are none of these that will stand our average winter. Therefore, in the selection of varieties I do not think hardiness should weigh against productiveness. All must have protection, so that the largest yielder should have the preference.

THE ROYAL HORTICULTURAL SOCIETY OF ENGLAND.

PROF. W. M. HAYS, ST. ANTHONY PARK.

(Written from London, England, in July, 1899.)

The Royal Horticultural Society of England, being very old and most favorably located, is very strong. There are now about five thousand members. These pay in membership fees and in special funds about $30,000, or $6.00 apiece yearly; something like $15,000 more is realized as receipts at their shows, making an annual income of $45,000.

Amateur science is a great fad in England. Many wealthy men take up science for science's sake and make much out of it. Numerous men of comparatively small incomes also make a specialty of some line. Preachers, bankers, merchants and even prominent brewers have their specialties, in which they have gained more or less of eminence. Many of these men have been interested in botany, entomology or some other line associated with horticulture, and they naturally sought the congenial atmosphere of the horticultural society and of the various gardener's clubs, which abound in England. While these scientific men form a very interesting group of the membership, the society is made up largely of growers of flowers, fruits and vegetables.

There are not so many professional scientists in England as one would expect to find, especially in the sciences related to industries. Private enterprise having assumed to develop, direct and control things scientific, parliament and the lesser legislative distributors of the moneys accruing from public taxation have not undertaken to build up great governmental schools, experiment stations and scientific laboratories. We, coming after them and seeing the great need of scientific development, have begun to push these institutions with public moneys. While our people are still in the stage of hastily getting riches, and individuals are not ready to take up all the burdens of higher education and of research, our states' taking hold of these affairs has tended to curb private enterprise. I wish we might do more to encourage amateur scientific research of a high class. Numbers of these English amateurs have done wonders in making new flowers. What could some of our bright young business men or professional men do to make their spare moments pleasant and of use, better than to work up something useful? The country homes of these wealthy amateur scientists are places of joy to the visitor.

We have much to learn from English life. They live more. They are not in such haste to leave the country for the city. I trust that the entrance of girls into our superb agricultural high school is a most important step looking towards better living in our farm homes.

Besides holding meetings and shows, the Royal Horticultural Society issues many reports and does much to promote the work of horticultural scientists. It has trial grounds where new things are tested, and if found of superior merit given certificates. Certificates and prizes are awarded at the shows also, Horticultural schools

and horticultural professorships are much in the back ground, the field being occupied by the amateur workers. What little government aid there is doled out is in the main given in small parcels to various general educational schools. We are bound to lead them in horticultural pedagogics, and their best men sorrowfully admit the fact.

While we may be able to push ahead of them in the science of horticulture, we cannot hope to do so in its practice. Their long training, their cheap labor, their more salubrious climate, their larger markets and their long experience with the things they are growing, gives them the lead. Then, too, they are here near this great center where the libraries, the botanic gardens, the large meetings and the much communication permissible by their short distances, enables the individual to learn much from others. As I listened to the venerable men of their society tell of the growth and achievements of the organization, I thought of the reminiscences of our older members. Taking everything into account, the Minnesota Horticultural Society has done a wonderful work for the people of the state. If Uncle Harris and his elderly fellow members of the Minnesota society could be in the meetings and shows of the Royal Horticultural Society, they would go home feeling none the less proud of having led in the growing of apples, plums, small fruits and flowers in the north star state. Peter Gideon would have felt at home in the international conference of plant breeders. His intensely practical work would have interested these men, many of whom see only the scientific principles involved.

The Royal Horticultural Society did a good thing in calling this conference. The American representatives have their heads together for a similar meeting on our side. I only wish we might have it in Minnesota. Plant breeding is in a great boom. The Americans were complimented for their keen sense of the practical. Later on I hope to present to the society a brief report of the plant breeders' conference.

The English people constantly express their warm feeling of friendship for America. They did this constantly in the meetings and banquets and before the representatives of other nations, I sometimes feared to the discomfiture of the latter.

REMEDY FOR BORERS.—Where the trees have a rough bark, remove all the projections by scraping with some blunt instrument. Then scrub the trunk and the lower part of the limbs with a mixture made by mixing 1 quart of soft soap or 1 pound of hard soap with 2 gallons of water, and after the mixture has been heated to boiling add 1 pint of crude carbolic acid. A small amount of Paris green and lime may be added to this, if desired. With the scrubbing brush apply this mixture to the trees late in May or early in June and then twice at intervals of two or three weeks thereafter. The object of these applications is to prevent the laying of eggs and the hatching of grubs.

PRACTICAL FORESTRY.

PROF. S. B. GREEN, ST. ANTHONY PARK.

(Read before the Minnesota State Forestry Association.)

In my address before you last year I outlined in a general way what a course in forestry should consist of and showed you that most of the studies that were considered essential for a good forestry course were already taught in the university, that all that was needed in this connection was to group them together and have the forestry side of them somewhat emphasized. In addition to this, increased instruction would be necessary in two or three subjects especially related to forestry, but the expense of establishing such a school would not be very considerable. I also referred to the fact that the demand today for skilled labor in forestry was exceedingly limited and that it seemed probable that in the establishment of practical forestry it would be most practicable to use considerable of the help that is now employed in the harvesting of our wood crops, but with some intelligent supervision. I have no special reason to change my rather conservative views expressed at that time, but I feel that the sentiment in favor of establishing such a school and the sentiment in favor of the state of Minnesota doing something to administer in a more intelligent way its great holdings of forest land, has received something of an advancement.

It seems to me that as an association we should lay special stress upon the importance of the state taking the initiative, for it is the largest holder of forest lands in this section and should set a good example in administering such property. In order to have a forestry school established with much life in it, it is very desirable and, I think, almost absolutely necessary, to have a forestry experiment station conducted on practical lines. We can combine this with a reservation or health resort, if we wish, but its primary object should be that of making experiments in the growing of trees for timber. As to where this should be located and how it should be obtained, I am at loss to say. The United States government still owns large holdings of forest lands in this state that would be well adapted to this purpose, and possibly upon application by the board of regents or the legislature, congress would donate to such a school enough land for this purpose. Some of the state land, although generally too much scattered for best results, could be used very well for this purpose. The university has some considerable salt spring lands that certainly ought to be managed on some forestry principles.

I would like very much indeed to hear the opinion of the members present on this matter and to have it given a full and free discussion at this time.

In the past the work in forestry, not only in this state but elsewhere, has been marked by a large amount of theory and a comparatively small amount of practice. What we need to do now is to try and reverse this and to have all of our reports, so far as possible, based on a practical test of trees that have been found out to be most valuable in this country under various economic conditions. I

think that the forestry literature of this country is to be criticized as being too largely of the European sort, especially of the German sort, and it seems to me that it is very foolish indeed to talk about German systems of forestry, unless you introduce German economics, and we, of course, think this quite impossible.

In selecting reservations there are a number of points that should be borne in mind. Too much sameness of land will limit the range of experiments. In this state it would seem as if practical forestry was going to be confined almost entirely to the growing of coniferous trees, especially white and Norway pine and, in some sections, spruce, and we should aim to select land with the purpose of obtaining, if possible, good stands of all three of these trees. Light soil and heavy soil should also be obtained, for there are large stretches of sandy soil in this state which will probably never be adapted to agricultural purposes, and if the present system, or lack of system, in their management continues evidence seems to show that sometime they will become drifting sand dunes. It would also be desirable to have some land well adapted to the growth of deciduous trees, especially such as the soft maple and some of the poplars, for it is quite evident that these trees will make merchantable lumber on moist soil much quicker than any of the pines, and in the search for cheap lumber which is bound to come after the white pine is cut off I am disposed to think that probably the soft maple will play quite an important part, especially for flooring and interior finishing, for which it seems well adapted. The growth of oak should also receive some attention, for although land that is well adapted to the hardwood is comparatively limited in this state and will probably be used for agricultural purposes, yet it is worth while to make some experiments with this class of trees. Some of the Rocky Mountain conifers should be tried, especially the Douglas spruce, which has proved to be very hardy in this state, and which on the Pacific coast and in the Rocky Mountains makes a very large and rapid growth. In addition to this, I think we should try the black spruce of Maine, which seems to be a larger and more rapid growing tree than the kind that we have here.

It seems to me that it would not be desirable to experiment very largely with many kinds other than those which I have mentioned. It might, perhaps, be well to have some swamp land that is adapted to the growing of white cedar, as the supply of white cedar is becoming quite limited. Such a reservation as this, besides offering good opportunities for the study of the wood-producing qualities of different trees, would afford most excellent opportunities for studying the best means of securing new growth upon the land. I am thoroughly well convinced that the planting of land with forest trees for lumber is impracticable in this state on account of the great cost, and my idea would be to confine our efforts almost entirely to the reproduction of trees from seed and to try the best ways of securing the natural re-seeding of the land with valuable kinds. In most of the European states that are renowned for their well managed forests, comparatively little work is done in replanting, and the forest manager who has a very large amount of planting to do is often

regarded as being rather inefficient and is apt to be replaced with some one who can see to it that nature is given the best chance for re-seeding the land in her accustomed way.

Experiments should also be made in the cutting out of the poor kinds to give the better kinds a better chance. It often happens that where the land is pretty well seeded to white pine that poplars and other trees of little value crowd in so thickly that the young pines are smothered. A little attention to the cutting of the brush at the right time would give the pines advantage over the poplars and secure a stand of pine instead of poplar. This same will apply to other trees as well as the pine.

The experiments which I would have in mind as to renewing tree growth would be largely those which could be conducted by the axe and bush scythe, for I thoroughly believe that if we are to have any system at all, that these will be found the most practicable tools in securing the re-seeding of the land to the most valuable new growth.

We need to have a study made of the light-demanding and shade-enduring qualities of all our trees, especially those that are valuable for timber, in order to find out the best conditions under which we can secure a new growth of the valuable kinds. It is well known to all foresters that there is a great difference in the amount of shade which certain trees will bear. Some trees, as the cottonwood and most of the poplars, Norway and jack pines, will endure very little shade. On the other hand the hop hornbeam and ironwood and the white pine will endure considerable shade.

The advantage of this study is that it shows what it is possible to grow upon the land. For instance, I have seen in this state a high growth of poplar with trunks ninety feet high and the tops nearly forming a canopy over the land, while underneath was a beautiful growth of white pine, six inches in diameter and fifty feet high, that had been greatly improved from the crowding which it had received from the poplars, which was not hurt by the shade of the poplars and was in just the right condition to take profitable possession of the entire land. Underneath these pines there was a thick growth of brush. In such condition the soil is best protected from the sun and the snows are retained to best advantage, and all the light conditions and soil conditions have been fully availed of. We have other conditions in this state which occasionally closely resemble this one. For instance, on our hardwood land it is not uncommon, at least over small areas, to see a full canopy of tall maples or oaks under which there is a good growth of hop hornbeam, under which there is a growth of kinnikinnick and some other of our shade-enduring shrubs.

It is very important to study these conditions in order to know how to protect the soil and how to renew the tree growth on the land to the best advantage and how to make it yield the greatest product of good timber. It is in such ways as these that forests are cultivated, and such cultivation is worthy of most careful study and experiment, and we have never tried it here on any considerable scale.

APPLE SEEDLINGS AT PETER M. GIDEON'S PLACE.

(Some months since Prof. N. E. Hansen visited the place of this veteran horticulturist, at Excelsior, Minn. The following interesting article is an extract from a published account of this visit. Sec'y.)

Mr. Gideon has many seedlings coming on of Wealthy, Peter, Martha, Florence and other of his earlier seedlings. He is still working for the long keeping apple. On being asked how he expected to get it, Mr. Gideon replied: "I have many of the best long keeping American apples in orchard. If they bear before we have another such hard winter as 1884-85, I hope to cross these American long keepers with my hardiest cross-bred Siberians and then plant the seed of the American long keepers. My experience with thousands of seedlings is that a seedling will ripen its fruit at or near the season of its mother. From the Siberian the first requisite, hardiness, will be obtained; from the American, the long keeping capacity. It is useless to plant seed of the common American market apples. In my first attempts I planted in orchard and grubbed out again more than twenty thousand seedlings of old Eastern market varieties before I got one apple to eat. Every year I would plant seed, and the next winter would clean them all out. Every year for nine years I persevered, and at the end of ten years I had one tree left, and that one was a crab seedling; so I regard that point as well demonstrated on my grounds. I am this year planting seed of the Peter only, which is one of my first seedlings of the Wealthy. I cannot distinguish between these two varieties by the fruit, but the Peter is the hardier tree; it is as hardy as a crab. I now have between two and three thousand seedlings of the Peter from seed sown last spring.

"I have had very poor success with apple seed kept dry over winter and soaked and frozen in the spring. My method is to plant in the fall. I have had very good success with planting the cores, or the pomace fresh from the cider press, covering not more than one inch deep. Seed gathered in the fall at various times may be dried a little in the shade without harm and then planted as soon as possible in the fall, and covered not over one inch deep. Have had little trouble with cut worms. I leave the seedlings in nursery row two years, and then select those of clean, smooth growth, with perfect terminal bud. My rule is always to reject a seedling if it loses its terminal bud the second winter. A seedling of smooth, clean growth with large, smooth, thick leaves and not too many thorns, is promising. Wealthy and Peter both had thorns on when young, but not many. Any little thorny, brushy seedling, generally with small leaves, I throw away every time. The seedlings are all taken up and the rejected ones are cut off and used at once as stocks for root-grafting, if needed."

ECONOMICAL IRRIGATION.—The California experiment station finds that irrigation water does the most good when placed close to the stem of the plant or trunk of the tree and allowed to soak downward.

PROFITS OF CURRANT CULTURE.

WM. H. BRIMHALL, HAMLINE.

There is a profit in currant culture if rightly managed. I have realized well on them in a small way, but do not wish to be understood to say that I have managed them in the right way to receive the most profit. I doubt not that others have had even larger returns from different methods of cultivation than that followed by me. Having tried the method of mulching heavily instead of cultivation, I must say it has not been satisfactory to me, though the two years when they were so mulched were wet; I think that had the season been dry it might have been otherwise. So to give you the profit of currant culture, I can do no better than to give you the yield of my one-fourth acre of the Prince Albert variety.

My soil is quite a heavy clay soil. I selected ground sloping slightly to the east, it having been previously well manured. The ground was then furrowed out about six feet apart and the bushes set about four feet apart in the rows. The bushes were two years old when set and were well cultivated that season. The next spring the entire ground was covered with the scrapings from the horse-shoeing shops and well cultivated during the whole season. The same process was followed each succeeding year, and besides spraying and harvesting the crop there was very little else to be done except in spring just after the new wood started nicely they were gone through and any branches that showed a wilted appearance or in any way did not look thrifty were cut out—in them could be found the currant borer. These branches were all put into a basket, carried out and burned. The bushes should be gone through two or three times, as those missed will after making more growth droop over and can be readily seen; but often when left too long the borer will have eaten his way out and gone.

The crop sold the second year from planting was not kept close account of, but the three years following the yield was one hundred bushels, or seven and one-ninth quarts per bush per year. Counting the cost of the bushes at $25.00, the care of the ground at $25.00 for the season,then for the second year the care and picking at $50.00,and I had a bed of four years old bearing bushes all paid for from the second year's crop. The third year the care needed was about the same, $25.00; picking one hundred bushels at one cent per quart, $32 00; crates for the same, $20.00; making a total of $77.00. Figure your currants at about $1.75 per bushel, and you have at the yield mentioned a profit of three hundred and eighty two dollars per acre. What can be done in a small way can be done in a reasonably larger way, and the cost of care lessened.

I do not wish to recommend any certain method of cultivation or any particular variety for profit, for my experience with different modes of cultivation and of different varieties has been very limited. I have, as I said before, had the best success by thorough cultivation, having the ground clear of rubbish in the fall.

As to varieties, I have grown mostly Prince Albert, with, also, the Red and White Dutch. The White Dutch are very productive with me, and the past season sold readily, though in seasons past

did not sell only in small quantities. My experience has been that if the late varieties are grown or the season for ripening can be prolonged, a better price is received for the crop. Taking into consideration the length of time that a currant bush will bear fruit if well cared for, I think the culture of currants as profitable as that of any other of the small fruits.

WHY NOT HAVE A PLUM ORCHARD?

F. W. KIMBALL, AUSTIN.

While thousands in our climate have been disappointed in the raising of apples, owing to various causes, chief among which has been the putting out of improper varieties, not suited to this dry, cold climate, and lack of care after being set, and the idea has become almost dominant in some sections that apples cannot be raised, yet who ever heard any one say that plums could not be raised? Why, every thicket of timber in the country in an early day, and the back yards of most of the old settlers, would give the lie to such an assertion; yet, thousands though living on farms and many thousands living in villages who could readily have it still lack that one great luxury so easily attainable.

Whoever has attended our state fair and given any attention to the horticultural department could not have failed to notice the large exhibit of selected wild plums, varying in size, color and taste, but not a single one without excellency for some purpose and most of them good for all uses to which a plum can be put, eating out of hand, using fresh for the table, sauce, canning and preserving. I presume it can be confidently said that there are more than fifty varieties common to all who may desire, and some parties have over one hundred named varieties. They vary in being free or cling stone, early or late. Some have a skin that easily parts, thus making them easy to prepare for the table when in season; some large, extremely large, and some medium; some coming early in season, and others late. With a few trees one can select to easily have fresh plums for from six weeks to two months. Just think of the delight of the children in daily running to the plum trees, to say nothing of the solid comfort the older portion of the family take! We eagerly buy peaches, yet we have plums that easily rival them in everything except size, and can raise them with less exertion than most any other fruit. Then think of the solid comfort the housewife feels in knowing that she can at any hour go into the orchard and gather for canning or supper, and also of the solid comfort the balance of the family take in eating them during the season when green fruits are scarce or unobtainable.

Now, if I have interested you into thinking of the plum, let me advise you what to do, i. e. set down and immediately order from some good, reliable nurseryman whom you know, or know is reliable at least, a baker's dozen, and if you have ground many more. They will stand a good deal of crowding, and if your ground is limited, yet you can manage to set a good many of those easily obtainable. The Cheney, Gaylord, Forest Garden, Rockford, De Soto,

Rollingstone and Cottrell cover a good long period, but don't miss the Cheney, because it is the earliest, nor the De Soto, for it is the latest of those mentioned. Of course, of the many varieties mentioned these don't comprise by any means all the good ones and, possibly, not the best. The Aitken and Surprise are probably among the very best, but are comparatively new, consequently not generally propagated and high in price. Some good reasons why one should plant several kinds are, first, if planted near together it may help in fertilization of blossoms of some that may not be perfectly bisexual. Again, some varieties seem to require just certain conditions of soil and location to do their best; while some, like the De Soto, seem always willing to do their level best in all soils and on all locations.

Now, as to location. Select, if you can, a good airy location, on high ground, so that the blossoms may not be injured by late frosts. Plant and care for as well as you would your corn for a few years. Later you can mulch with good straw or strawy manure, and if in a convenient locality build your hen yard around them, that the hens may scratch and eat up the worms and larvae that may infest them. They will stand a good deal of feeding, as they grow rapidly, and when young it is well to stake them up, as their foliage is so thick that they catch a good deal of wind and are thus easily broken. It is well each spring to trim them in, until they are well grown.

Some think that it is no use to set apple trees, that they can't expect to eat any apples from them; but who does not expect to live two years, and by that time you can begin to eat the plums, if you give them good care and nourishment? In 1896, I picked many plums from Cheney, Forest Garden and De Soto set in 1894. In 1897, I picked as many as six quarts per tree from Cheney and Rockford set in spring of 1895, and from the De Sotos set in 1894 I picked over one-half bushel per tree, from several of them. Don't let this year pass without setting a few.

HALF SHADE AND VEGETATION.—B. D. Halstead reports a number of experiments in shading various truck crops with frames of lath upon supporting stakes; the spaces between the lath equaling their width, so that half the direct rays are intercepted. In general the shade retarded the germination of lima beans in the first crop, but the opposite was the case with the second or midsummer planting. All root crops, such as turnips, carrots and potatoes, had a larger leaf surface in the shade, but the roots were much smaller. The shade improved the growth of salad crops, such as lettuce, spinach, Swiss chard, etc., and celery was improved most of all. The time of blooming was greatly retarded and the period of fruitfulness materially prolonged by shading beans, peas, egg plants, tomatoes, cucumbers and the like. Leaves grown in the shade are usually of a deeper green color and thinner than those grown in full exposure. These results will be carefully noted by market gardeners and vegetable growers.—*O. J. Farmer.*

THE MELON PEACH AND ITS POSSIBILITIES.

MRS. A. G. LONG, EXCELSIOR.

Many of you no doubt are familiar with what is called the melon peach, but are perhaps not aware that the possibilities in its use are almost as varied as that of the peach or apple.

While we have got a great abundance and surplus of fruit in our household, the melon peach has come to stay as much as the strawberry. The fruit resembles an orange in size and color; the taste is somewhat like that of the muskmelon, but it is slightly acid. It is very easily grown and is exceedingly prolific. It responds to the same culture as that given the melon and cucumber; however, the hills may be planted closer, say about four feet each way. It ripens its fruit about the first of August, and this past fall, by covering lightly with marsh hay on cool nights, we extended its season to the first of November, a period of three months. The vine is so prolific that the fruit almost touches one another. One year we picked from a plat of ground containing thirty-six square feet three bushels of ripe fruit. In this connection it might be mentioned that the fruit is not thoroughly ripe until it detaches itself from the vine.

Now as to its uses on the table. When thoroughly ripe it may be used as a sauce in a raw state, by peeling and removing the seeds, then cutting into thin slices, adding sugar and letting it stand a half hour or more, eating it with or without cream, as desired.

It also makes very delicious pies, which may be improved by the addition of a little lemon extract, or, better still, by a few thin slices of lemon.

For sweet pickles and mangoes it is unsurpassed, and is treated in the same way as other pickles, which is a matter familiar to all good housewives.

It is excellently adapted to the making of preserves. The addition of several lemons, thinly sliced, to each pound of fruit enhances its flavor. About a year ago we sent a two quart jar of preserves to a friend without telling her of what they were made. A short time later, a member of her family being ill, a consultation of physicians was held at the house. They were invited to dinner, and the melon peach preserves were served for dessert. No one at the table knew what they were made of, but the doctors attested to their excellency by committing a breach of table ethics in asking for a second dish.

It is also a good fruit with which to effect a compromise with the small boy, since when it is fully ripe it is relished by him eaten out of the hand, and the bushels of green fruit left at the close of the season serve him admirably as cannon balls in playing war.

To the dwellers on the prairie, or in places where soil or climatic conditions deny him the pleasure of growing fruit, the melon peach is something that may to a great extent take its place, and it is well worth a trial, even by those who are blessed with an abundance of fruit.

Calendar for September.

O. M. LORD.

The new strawberry bed now needs careful attention. Excessively warm weather with frequent showers has pushed the runners vigorously, and the weeds and grass are not behind in growth. Among the trees and bushes, we have been forced to resort to scythe cultivation. We do not highly recommend this method, as more or less weeds will go to seed, adding to the work of next year. The berries are all gathered, and no cultivation except among strawberries is needed. Cultivation late in the season stimulates new growth, which is liable to winter-kill.

It is a paying business to gather and feed out or destroy fallen fruit. Apples and plums have fallen before ripening in this vicinity much more than usual, largely owing to the prevalence of insects. Prof. Pammel says the fungous diseases can be controlled by carefully destroying infected fruit that sometimes remains on the trees all winter, maturing and scattering their spores to attack the next crop.

As predicted last spring, a good many apple trees have finally died from the effect of the cold last winter. Where they have been allowed to stand the vitality is gone, but where in many cases they were cut back severely the roots are sending up vigorous growth, which should be allowed to stand till next spring before trimming. Trees so grown may not be symmetrical, but will often produce fruit in abundance before young trees can be brought into bearing.

The effect of the last winter's cold was so variable and peculiar with different varieties, that we are still at a loss to know what to recommend. Some varieties that have generally been considered tender came through all right, and some counted as hardy died. We can, however, give one general rule applicable to most varieties. Where trees fruited heavily last year they suffered most. My old Walbridge that have fruited since 1884 are dead, but young trees that did not fruit last year are unhurt. Mr. Philips, of Wisconsin, however, makes a significant statement in the last "Wisconsin Horticulturist." He says if he were to plant another orchard and could have but one apple, it would be the Wealthy. I would like to dwell on this subject, but as it will be thoroughly discussed at our next meeting, it may not be profitable to say much here, but there is food for thought among those who would buy trees this fall.

The exhibit at the state fair will be another source of information that will be invaluable to those who would plant trees.

It is an open question whether it would be better for us, on low priced land, to adopt the methods of successive crops in garden and

fruit culture that the people of the east, on high priced lands, are obliged to make use of to make it pay. Their system evidently keeps the ground cleaner and in better shape, requires more expensive hand labor, but they invariably get better prices for their products. The value of our land need not be considered, so that all plants can be grown further apart and more reliance placed on cultivating with horses. This applies with equal force, whether a small area is to be grown for family use or on a larger scale commercially. In either case it is certain that care and clean culture pays best.

Fall setting of fruits is largely practiced in the south, but in this latitude spring setting is preferable for all kinds except black and red raspberries. Too much stress cannot be laid on the thorough preparation of the ground for any variety of fruits. Plowing this month and smoothing down to start the weed seeds into growth, by help of the September rains, will accomplish more at this time than later plowing or delaying till spring; besides, if the soil is naturally heavy, fall plowing will tend to ameliorate it.

During this month it will be necessary to gather and preserve seeds that would otherwise be injured by freezing. The principal points to be observed are to gather when fully ripe and when dry, and to preserve from dampness and mice. Apple seeds and the stone fruit seeds may be put into sand and wintered out of doors, and should be kept moist. For the stone fruits dry freezing will not do, as the shells will not then crack open. The planting of seeds for fruit should be attended to if we expect to reap much permanent benefit in growing it.

PRESSING PLANTS FOR COLOR.—All plants will not keep their color when pressed, but a large number will if they are carefully placed between papers that are thoroughly dry and quite porous. Nothing should be used which is glazed, and it is best to have a number of sheets between the specimens so they can dry without being changed at all. When smoothly arranged, put in a press, if one has such a thing, and gently apply pressure until you have a hundred or two hundred pounds. Without a letter press one can use a smooth board to lay them on and another over them, using stones or bricks, or any heavy thing to press them. But to save good specimens the pressure must be great. Plants that are juicy should not be put in with others, and layers of cotton between the papers is a great help. When about dry, then change to fresh papers. Dry the damp papers before using again. To mount them, white paper can often be obtained where newspapers are printed. Use a single sheet or one folded once, putting the plant inside. Take white gum arabic and dissolve in a bottle; put in whole cloves to preserve it; this makes excellent mucilage. Cover a piece of paper, and when dry cut into narrow strips and fasten down the stems of the plants onto the paper. At the bottom write the order and particular name with place where found and date of finding.—*Helen L. Norton.*

Secretary's Corner.

A CORRECTION.—For the word "planted," first word on the seventh line, page 295, August number, read "fruited." This correction, suggested by the writer of this excellent paper, explains away a proposition which perplexed the proof reader considerably.

A MINNESOTA JUDGE FOR APPLES AT THE WISCONSIN FAIR.—Mr. Clarence Wedge, of Albert Lea, has been appointed judge of apples at the Wisconsin state fair, which meets in Milwaukee, September 11-15. Minnesota retaliates by enlisting the services of A. J. Philips, secretary of the Wisconsin society, for a similar purpose at our own state fair.

THE AMERICAN ROSE SOCIETY.—An organization under this name has just been perfected, with Wm. C. Barry, Rochester, N. Y., president, and Paul Pierson, Scarborough, N. Y., as secretary. The life fee is $50, and annual fee for active members, $3, for associate members, $1. The annual meeting and exhibition of this society will be held the fourth Wednesday in lent.

PLANT SIBERIAN SEEDS FOR BUDDING.—Prof. N. E. Hansen has prepared for this number an article on root-killing, and in a letter to the writer he speaks of the necessity of our planting the seed of Siberian crab for budding. This article appears on the first page of this number, and will bear close reading. Save and plant a few Siberian crab seeds in accordance with his suggestion.

A THRIFTY ORCHARD.—J. A. Howard, of Hammond, has a thrifty orchard that is doing itself proud this "off year." He says, "I will have 700 or 800 bushels of apples this year with scarcely a worm in one of them. My Duchess trees are loaded. Apples are dropping the least I ever saw them—even the Wealthy does not drop.

PROFESSOR HAYS IN ENGLAND.—Our readers will be interested in the article published in this number from the pen of Prof. W. M. Hays, of the Minnesota State Experiment Station, in regard to the Royal Horticultural Society of England. Upon his return we hope to hear from him further on this interesting subject. He is making an effort to secure the reports of this society for our library.

THE MISSOURI FRUIT CROP.—The secretary of the Missouri Horticultural Society sent out August 1st, 500 requests as to the condition of the fruit crop. The returns from this indicate the average of the state for marketable apples to be about one-fourth of a full crop. This is rather discouraging for a state that makes fruit growing so important an interest. The Minnesota apple crop promises to be not far from the same average percentage.

ARE YOU COMING TO THE FAIR?—This number will reach our members too late probably to influence the exhibit in our department this year, but not too late that you should visit the fair, if for no other reason, for the opportunity it affords to study the fruit development of the state as exemplified in the horticultural department. Come to the state fair and make the horticultural building headquarters. You will feel at home there and receive a most cordial greeting.

WHO GOES TO THE POMOLOGICAL SOCIETY MEETING?—A number have spoken to the writer of attending this meeting of the American Pomological Society in Philadelphia, September 7th and 8th. As the rate there is very low, on account of the G. A. R. meeting, some old soldier who is a member of this society or, conversely, some member of this society who is an old soldier, should furnish us a delegate to this gathering. It will be a great meeting. Don't forget to notify the secretary if you are going.

PROSPERITY OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.—A note from Jacob W. Manning, Reading, Mass., a life member of this society, who has often met with us, says that the Massachusetts Horticultural Society pays out over $7,000 annually in premiums, and a new hall is in process of construction by them to cost $300,000. It is believed the society is worth a million dollars, estimating the value of the old hall and site at $700,000. Heretofore, the Philadelphia Horticultural Society has had the finest hall in the country.

FROM OUR TEXAS MEMBER.—Amasa Stewart, of Lemarque, Texas, one of the best known of the old members of this society, has done better than some of the resident members in sending in the report on fruit asked for. He says that apples do not succeed well so far south as that, though they do well in north Texas. Neither do crab apples succeed there. Plums, pears and peaches, however, are the great crop. It is also a good strawberry and blackberry country, though currants and gooseberries do not stand the long summers. We hope to greet this old member again at some annual meeting not too far off.

THE FOREST RESERVE MOVEMENT.—The movement to establish a large forest reserve in the pine woods region of this state is rapidly gathering force and has culminated lately in a strong organization of almost national character perfected at Chicago, of which President Northrup, of our state university, is president. The area of land under consideration for this use comprises a very large tract of undefined size in and about the head waters of the Mississippi river. A visit to this locality by the friends, in force, of this movement is contemplated this fall and is likely to result in a crystallization of purpose. The trend of public sentiment is evidently setting strongly in the direction of forest protection both for public and private domain and likely soon to bring about valuable practical results. The sympathies and services of this society are heartily enlisted in all this work.

A Glimpse at the Interior of Horticultural Hall, Minnesota State Fair, September, 1899.

THE MINNESOTA HORTICULTURIST.

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HORTICULTURE AT THE MINNESOTA STATE FAIR, SEPTEMBER, 1899.

A. W. LATHAM, SEC'Y.

The fortieth annual Minnesota State Fair proved to be the best attended and most successful event of the kind that has yet taken place in our state. Good weather and good times throughout the state resulted in an attendance on a par with the extent and character of the exhibits, which in all departments were of more than usual excellence. As to Horticultural Hall, its appearance was a source of satisfaction to the management and was evidently appreciated by the visitors. For the benefit of those who were unable to attend this brief description has been prepared.

The hall was decorated with green and white bunting, reaching across from post to post, over the wide central space, the whole length of the hall, relieving in a pleasing and restful way the bare, open rafter space above, with its unpainted wood color. Festoons of evergreen rope were suspended lengthwise of the hall between the posts and coiled around the piping used in lighting the hall with acetylene gas. Decorations of evergreen boughs, contributed by Mr. Underwood, were used upon the upper portion of the posts and in making arches over the windows entirely around the hall. The two longer sides of the hall, as usual, were banked up with a grand display of florists' plants, with the exception of a space on one side occupied by the seed exhibit of L. L. May & Co., of St. Paul, and on the other side a similar exhibit from Northrup, King & Co., of Minneapolis. Both of these exhibits were interesting and attracted much attention. At the south end of the hall the horticultural society booth was decorated with evergreens and native fruits, while at the opposite end the Jewell Nursery Co., of Lake City, had prepared a very attractive display with lofty cones veneered with apples on either side and shelving in the center covered with plates of apples and other fruits. Something over twenty barrels of apples were used in this display.

The fountain in the center of the hall was decorated with festoons of evergreen wreathing, while stone work was placed in the basin to furnish hiding places for the gold and silver fish which were sporting through its waters. The three long tables running lengthwise through the center of the hall were occupied, as usual, by displays

of fruit, excepting one at the north end, which contained the cut flower exhibit, of which there was an extraordinary array, making Wednesday, the day on which they were placed on exhibition, the most desirable one to visit the building.

The Minneapolis Mycological Club made a display of 140 plates of mushrooms on a part of the floral table, which they renewed from day to day with fresh specimens. This was an extraordinary exhibit, and was as much noticed and talked about as any other in this department. The interest in this subject will evidently warrant a larger opportunity for a similar exhibit another year.

The apples in the sweepstakes exhibit occupied the center table in the north end of the hall, which was surmounted by an extra table its entire length. As last year, the sweepstakes premium was largely contributed by John W. Thomas & Co., of Minneapolis, $100 being divided pro rata among the exhibitors from this source.

The number of entries in the fruit exhibit was somewhat in excess of last year, but on account of the very light crop of fruit in the state, the exhibit was a little less in quantity and somewhat so in quality as compared with the show in this building in 1898. But when all the circumstances are considered, the display was never a more creditable one to the fair management or the state horticultural society, to whose influence the success of this department is largely due. There were shown in the competitive exhibits 2,183 plates of apples, 260 of grapes, 258 of plums, one of peaches and one of sand cherries, besides some fifty jars of plums.

Besides the apples above enumerated, there were a large number of plates shown on the booth at the south end of the hall, and a very interesting exhibit on the side of the hall made by the Jewell Nursery Company, of fruit contributed by their patrons from different parts of the state, each being labeled with the name and locality of the grower. Aside from the commercial exhibits above referred to, another very neat one by C. W. Sampson, of Eureka, occupied the southwestern corner of the hall. In all, the number of plates of apples shown in the hall would easily have reached the total of 3,500, but no account was made excepting of those contained in the competitive exhibits.

Mr. Peter Gideon, of Excelsior, made a very fine display of twenty-seven plates of seedling apples from his place, and four plates of peaches. His presence during two days added greatly to the interest of his exhibit and gave his many friends an opportunity for greeting.

As usual, quite a number of the members of the horticultural society spent a considerable portion of the week in the hall. J. S. Harris, Wm. Somerville, J. A. Howard, Ditus Day, C. W. Sampson and John Nordine,—besides those connected with the management—were there during the whole week. O. M. Lord, whose show of plums constituted about one-fourth of the whole plum exhibit, including nearly every cultivated variety raised in the state, was with us excepting the last day. Wyman Elliot, D. F. Akin, A. A. Bost, H. M. Lyman, R. L. Cummins, E. H. S. Dartt, Prof. S. Green and Pres. W. W. Pendergast also spent some time in the hall. This is by no means a complete list, as other members of the society by

the score were there for a time, longer or shorter, and it was an opportunity for reunion under most pleasurable circumstances.

The display of apples made by E. H. S. Dartt, from the Owatonna trial station, deserves special mention. There were about 150 plates in the collection, the larger part of them being seedlings from the experiment nursery, many of which were bearing for the first time and of which the quality had not been tested until they were put on exhibition there. Mr. Dartt spent two days testing them, with other enthusiasts, and making selections of those especially worthy for future trial.

The management were fortunate in having the presence during the entire week of Mr. George J. Kellogg, of Janesville, Wis., who acted as judge of grapes. At the suggestion of the writer, Mr. Kellogg made some friendly criticisms on this department, which appear in another place in this magazine, and our readers will do well to give them attention, as coming from one who has had much experience in this line. Mr. A. J. Philips, secretary of the Wisconsin Horticultural Society, was there by request, and conjointly with Prof. Green judged the apples. At the request of the management Mr. Philips had prepared an exhibit of Wisconsin seedlings. Aside from this display all the fruit in the hall was grown within the state of Minnesota. A list of the Wisconsin seedlings shown in this exhibit follows:

NAMES.	Season.	Size.	County of origin.	Specimens given by	About the year of origin.
Wolf River	Oct. to Jan	12 to 24 oz.	Waupaca	A. J. Philips	1861
Northwes'n Greening	Jan. to May	10 to 16 oz.	Washara	A. J. Philips	1865
McMahon	Sep to Nov	10 to 15 oz.	Richland	A. J. Philips	1873
Windsor	Jan. to March	6 to 10 oz.	Dane	H. Tarrant	1870
Murry	Oct. to Dec	6 to 10 oz.	Rock	H. Tarrant	1875
Pewaukee	Dec. to March	6 to 10 oz.	Waukesha	A. J. Philips	1860
Eureka (sweet)	Dec. to March	6 to 8 oz.	La Crosse	A. J. Philips	1860
Avista	Dec. to March	6 to 8 oz.	La Crosse	A. J. Philips	1858
Ma's Apple	Dec to March	5 to 6 oz.	La Crosse	A. J. Philips	1860
Roxane	Dec. to March	5 to 8 oz.	Monroe	A. J. Philips	1883
Windorf	Dec. to March	10 to 12 oz.	Marathon	A. J. Philips	1883
Linnfield	Oct. to Nov	10 to 12 oz.	Waupaca	A. D Barnes	1885
Garfield Sweet	Jan. to March	10 to 12 oz.	Waupaca	A. D. Barnes	1875
Berlin	Dec. to Jan	6 to 8 oz.	Waupaca	A. D. Barnes	1875
Bessie	Oct to Nov	5 to 6 oz.	Waupaca	A. D. Barnes	1875
Ratsburg	Sep. to Oct	12 to 20 oz.	Waupaca	A. D. Barnes	1875
Barnes	Dec. to March	4 to 6 oz.	Waupaca	A. D. Barnes	1880
Newton	Dec. to March	4 to 6 oz.	La Crosse	A. J. Philips	1889
Wisconsin Spy	Jan. to Feb	4 to 6 oz.	Dodge	A. J. Philips	1880
Randall No. 19	Nov. to Dec	10 to 12 oz.	Outagamie	A. J. Philips	1888
Lillie	Dec. to Feb	10 to 12 oz.	Door	Zettle	1885
Minnie	Jan. to April.	6 to 8 oz.	Door	Zettle	1885
Fameuse Seedling	Jan. to April.	6 to 8 oz.	Door	Zettle	1885
Zettle	Jan. to April.	6 to 8 oz.	Door	Zettle	1885
Casey	Sep. to Oct	12 to 20 oz.	Waupeca	A. D. Barnes	1875
Sweet Russet crab	Sep. to Oct	Large.	Richland	A. J. Philips	1870

The florists, as usual, came to the help of this department and willingly provided all the decorations that were asked for. Besides their competitive displays, referred to, they filled the urns about the fountain and decorated the fruit tables with palms and a great variety of cut flowers. While comparatively little is said about this

part of the exhibit, yet their contributions aided very greatly in making Horticultural Hall the beauty spot of the fair.

Those who were in attendance this year or have been in past years, it is unnecessary to invite to visit us in the future. We shall expect to see them as a result of the interest aroused by these visits. But to others who have not taken advantage of this opportunity, we make urgent appeal to visit this department of the state fair in the future, not only to create and increase an interest in fruit growing but to secure information as to what can be done in this line in our state.

A list of the awards in this department follows, and its study will give the reader a clear conception of what was done this year in our department.

PREMIUMS AWARDED AT MINNESOTA STATE FAIR, 1899.

APPLES.

Open to All.

SWEEPSTAKES COLLECTION.—J. S. Harris, LaCrescent, first, $25.00; W. L. Parker, Farmington, second, $15.00; A. A. Bost, Excelsior, third, $10.00.

SPECIAL FOR WISCONSIN SEEDLINGS.—A. J. Philips, West Salem, Wis., $15.00.

COLLECTION, HYBRIDS AND CRABS EXCEPTED.—Jewell Nursery Co., Lake City, first, $25.00; Wm. Somerville, Viola, second, $20.00; J. S. Harris, third, $15.00; Clarence Wedge, Albert Lea, fourth, $10.00; F. J. Peterson, Waconia, fifth, $5.00.

COLLECTION OF HYBRIDS AND CRABS.—W. L. Parker, first, $5.00; Jewell Nursery Co., second, $4.00; Wm. Somerville, third, $3.00; J. S. Harris, fourth, $2.00; F. J. Peterson, fifth, $1.00.

SINGLE PLATES.

ANTINOVKA—Jewell Nursery Co., first, $1.00; F. J. Peterson, second, 75c.; C. Wedge, third, 50c.

ANISIM—W. L. Parker, first, $1.00; F. J. Peterson, second, 75c.; Wm. Somerville, third, 50c.

LONG ARCADE—C. Wedge, first, $1.00.

BLUSHED CALVILLE—Jewell Nursery Co., first, $1.00; Wm. Somerville, second, 75c.

BRETT—Wm. Somerville, first, $1.00.

BEN DAVIS—C. Wedge, first, $1.00; J. S. Harris, second, 75c.; Wm. Somerville, third, 50c.

CHARLAMOFF, PETERSON'S—C. Wedge, first, $1.00; W. L. Parker, second, 75c.

CHRISTMAS—F. J. Peterson, first, $1.00.

CROSS—W. L. Parker, first, $1.00; F. J. Peterson, second, 75c.; C. Wedge, third, 50c

FAMEUSE—Jewell Nursery Co., first, $1.00; Wm. Somerville, second, 50c.

GILBERT—J. S. Harris, first, $1.00; Wm. Somerville, second, 50c.

GRUNDY—Jewell Nursery Co., first, $1.00.

HARDING—Jewell Nursery Co., first, $1.00.

HUMBOLDT—Jewell Nursery Co., first, $1.00.

HAAS—W. L. Parker, first, $1.00; C. Heins, second, 75c.; J. S. Harris, third, 50c.

JUDSON—Jewell Nursery Co., first, $1.00.

KAUMP—C. Wedge, first, $1.00; Wm. Somerville, second, 75c.

LONGFIELD—Jewell Nursery Co., first, $1.00; W. L. Parker, second, 75c.; J. S. Harris, third, 50c.

LUBSK QUEEN—Wm. Somerville, first, $1.00; C. Wedge, second, 75c.

LOWLAND RASPBERRY—C. Wedge, first, $1.00; Jewell Nursery Co., second, 75c.

MCMAHON WHITE—W. L. Parker, first, $1.00; J. S. Harris, second, 75c.; C. Wedge, third, 50c.

MALINDA—C. Wedge, first, $1.00; Wm. Somerville, second, 75c.; W. L. Parker, third, 50c.

OKABENA—Jewell Nursery Co., first, $1.00; W. L. Parker, second, 75c.; W. L. Taylor, Litchfield, third, 50c.

OSTREKOFF—J. S. Harris, first, $1.00; C. Wedge, second, 75c.

PATTEN'S GREENING—J. S. Harris, first, $1.00; W. L. Parker, second, 75c.; Jewell Nursery Co., third, 50c.

PEACH—W. L. Parker, first, $1.00; Jewell Nursery Co., second, 75c.; Wm. Somerville, third, 50c.

PEERLESS—W. L. Parker, first, $1.00; A. A. Bost, second, 75c.; C. Heins, third, 50c.

PHOEBE—Jewell Nursery Co., first, $1.00.

PETER—C. Wedge, first, $1.00; A. A. Bost, Excelsior, second, 75c.

REPKA MALENKA—C. Wedge, first, $1.00; Wm. Somerville, second, 75c.

ROLLIN'S PROLIFIC—Wm. Somerville, first, $1.00; Jewell Nursery Co., second, 75c.

SANDY GLASS—Wm. Somerville, first, $1.00.

TAMA—Jewell Nursery Co., first, $1.00.

TALMAN SWEET—C. Wedge, first, $1.00.

TETOFSKY—J. S. Harris, first, $1.00; Jewell Nursery Co., second, 75c.

UTTER—J. S. Harris, first, $1.00; C. Wedge, second, 75c.; Jewell Nursery Co., third, 50c.

WOLF RIVER—Jewell Nursery Co., first, $1.00; C. Wedge, second, 75c.

WHITE PIGEON—Wm. Somerville, first, $1.00.

YELLOW SWEET—C. Wedge, first, $1.00.

YELLOW TRANSPARENT—Jewell Nursery Co., first, $1.00; J. S. Harris, second, 75c.; W. L. Parker, third, 50c.

DUCHESS OF OLDENBURG—W. L. Parker, first, $1.75; Jewell Nursery Co., second, $1.50; C. W. Sampson, Eureka, third, $1.25; A. A. Bost, fourth, $1.00; C. Wedge, fifth, 75c.; J. S. Harris, sixth, 50c.

HIBERNAL—W. L. Parker, first, $1.75; W. L. Taylor, second, 1.50; J. S. Harris, third, $1.25; C. Wedge, fourth, $1.00; A. A. Bost, fifth, 75c.; F. J. Peterson, sixth, 50c.

WEALTHY—W. L. Parker, first, $1.75; J. S. Harris, second, $1.50; C. Wedge, third, $1.25; A. A. Bost, fourth, $1.00; C. W. Sampson, fifth, 75c.; Jewell Nursery Co., sixth, 50c.

FOR AMATEURS ONLY.

COLLECTION, HYBRIDS AND CRABS EXCEPTED—F. J. Peterson, first, $15.00; Wm. Oxford, Freeburg, second, $10.00; J. A. Howard, Hammond, third, $8.00; Ditus Day Farmington, fourth, $4.00; H. H. Heins, fifth, $2.00.

COLLECTION OF HYBRIDS AND CRABS—Ditus Day, first, $5.00; J. A. Howard, second, $4.00; H. H. Heins, third, $3.00; F. J. Peterson, fourth, $2.00; Wm. Oxford, fifth, $1.00.

SINGLE PLATES.

ANTINOVKA—F. J. Peterson, first, $1.00; D. F. Akin, Farmington, second, 75c.

ANISIM—F. J. Peterson, first, $1.00; J. A. Howard, second, 75c.; H. M. Lyman, Excelsior, third, 50c.

BEN DAVIS—Wm. Oxford, first, $1.00; J. A. Howard, second, 75c.

CHARLAMOFF, PETERSON'S—F. J. Peterson, first, $1.00; H. H. Heins, second, 75c.; H. M. Lyman, third, 50c.

CHRISTMAS F. J. Peterson, first, $1.00.

CROSS—F. J. Peterson, first, $1.00; J. A. Howard, second, 75c.

FAMEUSE—Ditus Day, first, $1.00.

GILBERT—F. W. Kimball, Austin, first, $1.00.

HAAS—Ditus Day, first, $1.00; D. F. Akin, second, 75c.; J. A. Howard, third, 50c.

KAUMP—J. A. Howard, first, $1.00.

LONGFIELD—J. A. Howard, first, $1.00; F. W. Kimball, second, 75c.; H. M. Lyman, third, 50c.

LUBSK QUEEN—H. M. Lyman, first, $1.00.

LOWLAND RASPBERRY—Ditus Day, first, $1.00; J. A. Howard, second, 75c.

MCMAHON WHITE—W. S. Widmoyer, Dresbach, first, $1.00; Wm. Oxford, second, 75c.; J. A. Howard, third, 50c.

MALINDA—Ditus Day, first, $1.00; J. A. Howard, second, 75c.; F. W. Kimball, third, 50c.

OKABENA—J. A. Howard, first, $1.00; Ditus Day, second, 75c.; Wm. Oxford, third, 50c.

OSTREKOFF—Wm. Oxford, first, $1.00.

PATTEN'S GREENING—C. W. Sampson, first, $1.00; Ditus Day, second, 75c.; J. A. Howard, third, 50c.

PEACH—Ditus Day, first, $1.00; J. A. Howard, second, 75c.

PEERLESS—C. W. Sampson, first, $1.00; Thos. Redpath, Long Lake, second, 75c.

PETER—D. F. Akin, first, $1.00; A. A. Bost, second, 75c.

ROLLIN'S PROLIFIC—J. A. Howard, first, $1.00.

SANDY GLASS—J. A. Howard, first, $1.00.

TALMAN SWEET—Ditus Day, first, $1.00.

TETOFSKY—H. P. Eberhard, Mound Prairie, first, $1.00; J. A. Howard, second, 75c.

UTTER—Wm. Oxford, first, $1.00; W. S. Widmoyer, second, 75c.

WOLF RIVER—Wm. Oxford, first, $1.00; W. S. Widmoyer, second, 75c.

YELLOW TRANSPARENT—H. P. Eberhard, first, $1.00; D. F. Akin, second, 75c.

DUCHESS OF OLDENBURG—J. A. Howard, first, $1.75; A. A. Bost, second, $1.50; C. W. Sampson, third, $1.25; Thos. Redpath, fourth, $1.00; H. H. Heins, fifth, 75c.: H. P. Eberhard, sixth, 50c.

HIBERNAL—F. J. Peterson, first, $1.75; H. H. Heins, second, $1.50; J. A. Howard, third, $1.25; Wm. Oxford, fourth, $1.00; H. W. Lyman, sixth, 50c.

WEALTHY—C. W. Sampson, first, $1.75; A. A. Bost, second, $1.50; Thos. Redpath, third, $1.25; J. A. Howard, fourth, $1.00; Jacob Klein, Hokah, fifth, 75c.; Wm. Oxford, sixth, 50c.

Open to All.

CRABS AND HYBRIDS.

BRIAR'S SWEET—Wm. Oxford, first, $1.00; W. L. Parker, second, 75c.

DARTT—Jewell Nursery Co., first, $1.00; J. S. Harris, second, 75c.

EARLY STRAWBERRY—J. A. Howard, first, $1.00; Jewell Nursery Co., second, 75c; W. L. Parker, third, 50c.

FLORENCE—Thos. Redpath, first, $1.00; H. M. Lyman, second, 75; C. W. Sampson, third, 50c.

GIDEON'S NO. 6—W. L. Parker, first, $1.00; Wm. Somerville, second, 75c.; Jewell Nursery Co., third, 50c.

GREENWOOD—F. J. Peterson, first, $1.00; W. L. Parker, second, 75c.; H. M. Lyman, third, 50c.

HYSLOP—C. W. Sampson, first, $1.00; W. L. Taylor, second, 75c.; Wm. Oxford, third, 50c.

LYMAN'S PROLIFIC—H. M. Lyman, first, $1.00; J. A. Howard, second, 75c.

MARTHA—H. M. Lyman, first, $1.00; W. L. Parker, second, 75c.; Jewell Nursery Co., third, 50c.

MINNESOTA—Jewell Nursery Co., first, $1.00; J. S. Harris, second, 75c.; Jacob Klein, third, 50c.

PRIDE OF MINNEAPOLIS—Thos. Redpath, first, $1.00; W. L. Parker, second, 75c.; J. S. Harris, third, 50c.

SWEET RUSSET—W. L. Parker, first, $1.00; J. S. Harris, second, 75c.; Wm. Somerville, third, 50c.

TONKA—C. W. Sampson, first, $1.00; H. H. Heins, second, 75c.; W. L. Parker, third, 50c.

TRANSCENDENT—H. H. Heins, first, $1.00; Jewell Nursery Co., second, 75c.; W. L. Parker, third, 50c.

VIRGINIA—F. J. Peterson, first, $1.00; Ditus Day, second, 75c.; D. F. Akin, third, 50 cents.

WHITNEY—J. A. Howard, first, $1.00; A. A. Bost, second, 75c.; C. Wedge, third, 50c

SEEDLING APPLES.

COLLECTION, EXCLUDING CRABS AND HYBRIDS—H. M. Lyman, first, $8.00; D. F. Akin, second, $6.00; Ditus Day, third, $4.00.

COLLECTION OF CRABS AND HYBRIDS—Ditus Day, first, $6.00; H. M. Lyman, second, $4.00; D. F. Akin, third, $2.00.

FALL VARIETY, NOT SWEET—H. M. Lyman, first, $6.00; D. F. Akin, second, $4.00; W. L. Parker, third, $2.00.

WINTER VARIETY, NOT SWEET—D. F. Akin, first, $10.00; H. M. Lyman, second, $8.00.

SWEET VARIETY, FALL OR WINTER—D. F. Akin, first, $6.00; H. M. Lyman, second, $4.00; Ditus Day, $2.00.

GRAPES.

COLLECTION.

Gust Johnson, Excelsior, first, $20.00; C. W. Sampson, second, $15.00; A. A. Bost, third, $10.00; H. L. Crane, Excelsior, fourth, $8.00; W. W. Woodbeck, Excelsior, fifth, $5.00.

SINGLE PLATES.

AGAWAM—H. L. Crane, first, $1.50; C. W. Sampson, third, 50c.

AMINIA—C. W. Sampson, first, $1.50; Gust Johnson, second, $1.00; W. W. Woodbeck, third, 50c.

BARRY—Gust Johnson, first, $1.50; C. W. Sampson, second, $1.00.

BRIGHTON—H. L. Crane, first, $1.50; Gust Johnson, second, $1.00; W. W. Woodbeck, third, 50c.

CONCORD—Gust Johnson, first, $1.50; H. L. Crane, second, $1.00; C. W. Sampson, third, 50c.

COTTAGE—Gust Johnson, first, $1.50; C. W. Sampson, second, $1.00.

DELAWARE—Gust Johnson, first, $1.50; H. L. Crane, second, $1.00; A. A. Bost, third, 50c.

DUCHESS—H. L. Crane, first, $1.50; Gust Johnson, second, $1.00; C. W. Sampson, third, 50c.

EARLY VICTOR—W. W. Woodbeck, first, $1.50.

ELDORADO—Aug. Wittman, Merriam Park, first, $1.50; Mrs. Isabella Barton, Excelsior, second, $1.00.

EMPIRE STATE—W. W. Woodbeck, first, $1.50; Mrs. I. Barton, second, $1.00.

GREEN MOUNTAIN—Gust Johnson, first, $1.50; W. W. Woodbeck, second, $1.00.

HERBERT—W. W. Woodbeck, first, $1.50.

IONA—H. L. Crane, first, $1.50; Gust Johnson, second, $1.00; C. W. Sampson, third, 50c.

LINDLEY—C. W. Sampson, first, $1.50; Gust Johnson, second, $1.00; W. W. Woodbeck, third, 50c.

LADY—Gust Johnson, first, $1.50; C. W. Sampson, second, $1.00; W. W. Woodbeck, third, 50c.

MARTHA—Gust Johnson, first, $1.50; W. W. Woodbeck, second, $1.00.

MASSASOIT—W. W. Woodbeck, first, $1.50; C. W. Sampson, second, $1.00.

MOORE'S DIAMOND—Gust Johnson, first, $1.50; H. L. Crane, second, $1.00; W. W. Woodbeck, third, 50c.

MOORE'S EARLY—H. L. Crane, first, $1.50; Gust Johnson, second, $1.00; Aug. Wittman, third, 50c.

NIAGARA—Gust Johnson, first, $1.50; W. W. Woodbeck, second, $1.00; Mrs. I. Barton, third, 50c.

POCKLINGTON—Gust Johnson, first, $1.50; Mrs. I. Barton, second, $1.00; A. A. Bost, third, 50c.

POKEEPSIE RED—Mrs. I. Barton, first, $1.50; Gust Johnson, second, $1.00.

TELEGRAPH—W. W. Woodbeck, first, $1.50; Gust Johnson, second, $1.00; Aug. Wittman, third, 50c.

WILDER—Gust Johnson, first, $1.50.

WOODRUFF RED—Gust Johnson, first, $1.50; W. W. Woodbeck, second, $1.00.

WORDEN—Gust Johnson, first, $1.50; C. W. Sampson, second, $1.00; Mrs. I. Barton, third, 50c.

WYOMING RED—Gust Johnson, first, $1.50; Mrs. I. Barton, second, $1.00; W. W. Woodbeck, third, 50c.

PLUMS.

COLLECTION OF PLUMS IN GLASS JARS—O. M. Lord, first, $10.00; W. L. Parker, second, $8.00; A. A. Bost, third, $6.00.

COLLECTION NOT IN GLASS JARS—O. M. Lord, first, $5.00; W. L. Parker, second, $4.00; J. G. Bass, Hamline, third, $3.00.

AITKIN—C. W. Sampson, first, $1.00.

CHENEY—C. W. Sampson, first, $1.00; A. A. Bost, second, 75.; J. A. Howard, third, 50.

DE SOTO—H. F. Busse Minneapolis, first, $1.00; O. M. Lord, second, 75c.; W. L. Parker, third, 50c.

FOREST GARDEN—W. H. Brimhall, Hamline, first, $1.00; J. A. Howard, second, 75c.; D. P. Delamater, Edina Mills, third, 50c.

HAWKEYE—Dewain Cook, first, $1.00; O. M. Lord, second, 75c; H. F. Busse, third, 50c.

LORD—Jewell Nursery Company, first, $1.00; W. L. Parker, second, 75c.

MANKATO—Dewain Cook, Windom, first, $1.00; O. M. Lord, second, 75c.

NEW ULM—Dewain Cook, first, $1.00; O. M. Lord, second, 75c.

OCHEEDA—H. H. Heins, first, $1.00; W. L. Parker, second, 75c.; Dewain Cook, third, 50c.

ROCKFORD—O. M. Lord, first, $1.00; W. L. Parker, second, 75c.; J. G. Bass, third, 50c.

ROLLINGSTONE—O. M. Lord, first, $1.00; Dewain Cook, second, 75c.; A. A. Bost, third, 50c.

STODDARD—O. M. Lord, first, $1.00; W. L. Parker, second, 75c.; Dewain Cook, third, 50c.

SURPRISE—Jewell Nursery Co., first, $1.00; O. M. Lord, second, 75.

WEAVER—H. H. Heins, first, $1.00.

WOLF—Dewain Cook, first, $1.00; Jewell Nursery Co., Second, 75c.; Chas. Giesmann, St. Paul, third, 50c.

WYANT—O. M. Lord, first, $1.00; Dewain Cook, second, 75c.; W. L. Parker, third, 50c.

WINDOM—Dewain Cook, first, $1.00.

SEEDLING—W. L. Parker, first, $5.00; W. S. Widmoyer, second, $3.00; L. D. Halls, Mendota, third, 50c.

SUNDRIES.

PEACHES—C. W. Sampson, first, $2.00.

ANCIENT BRITON BLACKBERRIES—H. L. Crane, first, $1.00.

SAND CHERRIES—C. W. Sampson, first, $2.00.

FLOWERS.

Open to All.

PLANTS.

COLLECTION OF GREENHOUSE AND HOTHOUSE PLANTS—L. L. May & Co., St. Paul, first, $30.00; R. J. Mendenhall, Minneapolis, second, $25.00; E. Nagel & Co., Minneapolis, third, $20.00; Jacob Hartmann, Minneapolis, fourth, $10.00.

COLLECTION OF FOLIAGE AND DECORATIVE PLANTS—R. J. Mendenhall & Co., first, $20.00; E. Nagel & Co., second, $15.00; Jacob Hartmann, third, $10.00.

COLLECTION OF CLIMBING VINES, FIVE VARIETIES—Jacob Hartmann, first, $2.00; E. Nagel & Co., second, $1.00.

COLLECTION OF FIVE HANGING BASKETS, ONE OF A KIND—L. L. May & Co., first, $1.00; E. Nagel & Co., second, $3.00; Jacob Hartmann, third, $2.00.

COLLECTION OF COLEUS, SIX OR MORE VARIETIES—E. Nagel & Co., first, $2.00; Jacob Hartmann, second, $1.00; L. L. May & Co., third, 50c.

COLLECTION OF TUBEROUS-ROOTED BEGONIAS—E. Nagel & Co., first, $4.00.

SINGLE SPECIMEN PALM—L. L. May & Co., first, $3.00; R. J. Mendenhall, second, $2.00; Jacob Hartmann, third, $1.00.

COLLECTION OF GERANIUMS IN BLOOM—E. Nagel & Co., first, $4.00; Jacob Hartmann, second, $2.00.

TWELVE CARNATIONS IN BLOOM, NOT LESS THAN FIVE VARIETIES—E. Nagel & Co., first, $3.00; Jacob Hartmann, second, $2.00.

VASE FILLED WITH PLANTS AT THE FOUNTAIN IN HORTICULTURAL HALL—L. L. May & Co., first, $4.00; Jacob Hartmann, second, $3.00; R. J. Mendenhall, third, $2.00; E. Nagel & Co., fourth, $1.00.

CUT FLOWERS.

ASTERS, NOT LESS THAN SIX KINDS—L. L. May & Co., first, $3.00; Jacob Hartmann, second, $2.00; R. J. Mendenhall, third, $1.00.

CARNATIONS, SIX VARIETIES—E. Nagel & Co., first, $3.00; R. J. Mendenhall, second, $2.00; Jacob Hartmann, third, $1.00.

ROSES, SIX VARIETIES—L. L. May & Co., first, $3.00; R. J. Mendenhall, second, $2.00; E. Nagel & Co., third, $1.00.

BASKETS AND BOUQUETS.

FLORAL DESIGN—L. L. May & Co., first, $15.00; E. Nagel & Co., second, $10.00; A. S. Swanson, St. Paul, third, $6 00; R. J. Mendenhall, fourth, $4.00.

TWELVE-INCH BASKET OF FLOWERS—L. L. May & Co., first, $5.00; R. J. Mendenhall, second, $3.00; Jacob Hartmann, third, $2.00.

PYRAMID BOUQUET—E. Nagel & Co., first, $3.00; Jacob Hartmann, second, $2.00; R. J. Mendenhall, third, $1.00.

HAND BOUQUET—R. J. Mendenhall, first, $3.00; E. Nagel & Co., second, $2.00; Jacob Hartmann, third, $1.00.

BRIDAL BOUQUET—L. L. May & Co., first, $3.00; R. J. Mendenhall, second, $2.00; E. Nagel & Co., third, $1.00.

FOR AMATEURS ONLY.

PLANTS.

COLLECTION OF HOUSE PLANTS IN POTS—Mrs. Wm. Wyman, St. Paul, first, $5.00.

SINGLE GERANIUM IN BLOOM—Mrs. A. A. Brown, Minneapolis, first, $1.50.

SINGLE BEGONIA IN BLOOM—Mrs. A. A. Brown, first, $1.50.

CUT FLOWERS.

COLLECTION OF ASTERS—Mrs. E. O'Reilly, Merriam Park, first, $2.00; Mrs. Geo. Mohler, St. Paul, second, $1.00; Daniel Gantzer, St. Paul, third, 50c.

COLLECTION OF BALSAMS—Mrs. F. A. Rogers, Minneapolis, $2.00; Daniel Gantzer, second, $1.00.

COLLECTION OF DAHLIAS—Mrs. F. A. Rogers, first, $2.00.

COLLECTION OF EVERLASTING FLOWERS—Daniel Gantzer, first, $2.00; Mrs. M C. Axtell, Minneapolis, second, $1.00.

COLLECTION OF NASTURTIUMS—Mrs. Julia R. Blake, Minneapolis, first, $2.00; Mrs. Geo. Mohler, second, $1.00; Mrs. F. A. Rogers, third, 50c.

COLLECTION OF PANSIES—Mrs Geo. Mohler, first, $2.00; Miss H. English, St. Paul, second, $1.00.

COLLECTION OF PETUNIAS—Mrs. F. Moeser, St. Louis Park, first, $2.00; J. T. Grimes, Minneapolis, second, $1.00; Daniel Gantzer, third, 50c.

COLLECTION OF VERBENAS—Daniel Gantzer, first, $2.00; Mrs. F. J. Wilcox, Northfield, second, $1.00; Mrs. G. S. Brown, Minneapolis, third, 50c.

COLLECTION OF ZINNIAS—Mrs. Geo. Mohler, first, $2.00; Mrs. F. A. Rogers, second, $1.00; Daniel Gantzer, third, 50c.

CUT FLOWERS FOR CHILDREN UNDER FIFTEEN YEARS.

BOUQUET OF ASTERS—Albert Buel, St. Anthony Park, first, $1.50; Rosa Souden, St. Paul, second, $1.00; Lottie Souden, St. Paul, third. 50c.

BOUQUET OF BALSAMS—Lena Gantzer, St. Paul, first, $1.50.

BOUQUET OF EVERLASTING FLOWERS—Miss Lena Gantzer first, $1.50; Nannie Barrager, Minneapolis, second, $1.00.

BOUQUET OF NASTURTIUMS—Belle Romona, Hamline, first, $1.50.

BOUQUET OF PETUNIAS.—Lottie Souden, first, $1.50; Rosa Souden, second, $1.00; E. Apelt, Minneapolis, third, 50c.

BOUQUET OF SWEET PEAS.—Bell Romona, first, $1.50; Willie Brown, second $1.00; Lena Gantzer, third, 50c.

BOUQUET OF VERBENAS.—Lena Gantzer, first, $1.50.

BOUQUET OF ZINNIAS.—Mary Buell, first, $1.50; Nannie Barrager, second, $1.00; Lena Gantzer, third, 50c.

BOUQUET OF MIXED FLOWERS—Rosa Souden, first, $1.50; Lottie Souden, second, $1.00; Lena Gantzer, third, 50c.

BOUQUET OF PERENNIAL FLOWERS.—Nannie Barrager, first, $1.50.

BOUQUET OF PHLOX.—Nannie Barrager, first, $1.50; Lena Gantzer, second, $1.00.

CARIBOLIC SOAP FOR GREEN FLY.—The ordinary rose aphis and other species can be destroyed by the application of a solution made as follows: Dissolve 1 pound of carbolic soap in 2 gallons of boiling water; add 1 pint of this mixture to 4 pints of soft water and apply morning and evening to the infested plants.

BETTERING THE NEXT STATE FAIR.

GEO. J. KELLOGG, WISCONSIN.

[Mr. Kellogg has made below some criticisms as to the fruit exhibit at the late state fair. In the main they say "enforce your regulations," and for the intelligent understanding of the subject the regulations of the state fair referred to follow this article. Other criticisms are invited.—SEC'Y.]

Allow me to suggest some things about the horticultural department at your state fair, from an outsider.

Enforce rule No. 1, *grapes and all.*

Enforce rule No. 6, and furnish a *competent person* or *persons* who shall *do nothing else while the fruit is being placed and named.*

Enforce rule No. 8.

Enforce rule No. 9 and insist on it, and insist that the judges live up to it, and each one making an exhibit.

Enforce rule 10 *(b), (c),* and require statement at time fruit is put out. Bring them to time on *(c).*

In rule 11 have statement of what has been kept in cold storage.

Enforce latter part of rule 12.

I would suggest that sweepstakes be cut down to twenty-five varieties of apples, ten varieties of seedlings, ten varieties of crab apples, five varieties of plums, five varieties of grapes, and that the professionals and non professionals exhibit separate, and that no person can enter in both, and that a professional is one who makes most of his living in the fruit business.

After sweepstakes I would have lists of five, ten and twenty apples in both classes.

I would have hybrids and crabs separate and insist that hybrids must be bigger than crabs. I would reject all plates of standard varieties that did not make a commendable show; also all plates of seedlings, crabs and standards that were wormy and not up to size.

I would cut down the list of plates. Judges should be given their work the first day and not be hurried, and exhibitors must furnish lists.

I would make some radical changes so as to call out the farmer with his five or ten varieties.

In search of good seedlings, I would take the Wealthy as a standard and cut off everything that was not three-fourths the size of the Wealthy; that would have shut out three-fourths of all the seedlings on the tables.

I only find twenty-three exhibitors of apples, six exhibitors of grapes, and about six of plums—thirty-five in all. At Walworth, Wis., I had 907 entries of fruits, by 107 exhibitors. I think if you will divide up the money and make more premiums, you will improve your show.

RULES GOVERNING EXHIBITS, HORTICULTURAL DEPARTMENT, MINNESOTA STATE FAIR, 1899.

(Study this and make suggestions.—Sec'y.)

1st. To be entitled to compete for premiums and receive awards, each exhibit must be in place by Saturday night, Sept 2nd, before the fair opens.

2nd. The different kinds of exhibits of fruits must be arranged together, under the direction of the superintendent.

3rd. All articles competing for premiums must have been grown in Minnesota, or made from Minnesota products, and by the person in whose name they are entered, except as otherwise noted. When required, a statement to the judges must certify that they were so grown or made.

4th. A collection shall consist of three or more varieties, except as hereinafter noted, and they must be placed together, and a list of all the varieties included therein must accompany the collection. Any variety may be exhibited in a collection except a seedling, the original tree, bush or vine producing which is the property of the exhibitor.

5th. Four specimens, no more, no less, except as otherwise provided, must be shown of each variety of fruit exhibited, except that the number may be increased not to exceed one quart in quantity.

6th. Each article must be correctly labeled with its name, or, if an un-named seedling, it must be so stated; labels and pins of a uniform size for this purpose will be furnished exhibitors by the superintendent and must be used by the exhibitors.

7th. Each exhibitor must place his name and address conspicuously on his exhibit.

8th. Separate articles must be furnished for each entry. No duplication of varieties will be permitted in any exhibit, nor can any variety be shown under synonymous names. Apples of the same type, such as the Borovinka and Anisette, of the Duchess type, and Silken-leaf, Romna, Lieby, etc., of the Hibernal type, will be considered as duplicates in collective exhibits. The report of the La Crosse Commission, appointed by the Minnesota State Horticultural Society, will be recognized authority in matters of Russian nomenclature.

9th. Decayed, injured or inferior specimens must not be exhibited, and when such specimens appear in a collection not only will they not be counted but they will be considered by the judges as lowering the comparative standard of the exhibit. Taste in arrangement and neatness in the keeping of the exhibit will also be considered by the judges in making awards.

10th. Seedlings—*(a)*. The exhibitor of a seedling must be the owner of the original tree, bush or vine producing the same, or his sole authorized representative.

(b). Persons exhibiting seedlings which receive awards, except in collections, are required before receiving the premium money to furnish a written description of the tree, bush or vine, its location, age and history, and the owner's and originator's names and addresses.

(c). Seedlings, to receive awards, must be characterized by excellence at least equal to that of established varieties.

(d). A premium will not be awarded to a seedling, except as part of a collection, that has before received a premium at any Minnesota state fair.

11th. Fruits may be exhibited that have been preserved in cold storage, but not by any other process, except as otherwise provided.

12th. Where the number of competitors in any lot is less than the number of awards offered, the judges may, at their discretion, award the lower prizes, omitting the higher ones, but premiums will not be awarded on inferior collections or specimens, even if there is no competition.

13th. Exhibitors are requested to make entries with Secretary E. W. Randall, Hamline, at least one week before the opening of the fair, and positively no entries will be received after Saturday, September 2.

MUSHROOMS AT THE MINNESOTA STATE FAIR.

W. M. BABCOCK, MINNEAPOLIS.

The exhibit of the Minnesota Mycological Society, in the center of Horticultural Hall, attracted a great deal of attention.

To the society is due much credit for bringing to the attention of the people of Minnesota the great quantity of food that goes to waste annually in its woods and meadows.

THE MUSHROOM EXHIBIT.

There were on the table not less than eighty varieties of mushrooms, out of which at least twenty were edible. Much interest was shown in two plates of poisonous mushrooms, containing several varieties of the fatally poisonous amanita family.

Each day there were present one or two members of the society to answer questions and tell the inquiring public how to

distinguish the different varieties and how to cook the edible ones.

Among those most noticeable from an edible standpoint were a large number of the beautiful white parasol mushrooms, the common field mushroom, a perfect variety of the same, a beautiful white coral hedgehog mushroom and many specimens of puffballs, varying from the size of a thimble through that of an egg to a massive one as large as a man's head. Several of these puffballs were cut open to show the pure white flesh inside, and pieces were distributed to those who cared to try them. The members of the society recommend to all persons interested to gather puffballs, using only those that are pure white and of firm flesh inside (note this carefully). Cut out any wormy spots, peel and slice and fry in butter. The puffballs are the best to begin on, as none of the white flesh varieties are harmful. Many enthusiastic converts have been made by means of puffballs fried in butter.

Prizes were given for the best individual exhibits as follows: W. M. Babcock, first, $7.00; Mrs. E. F. Elliot, second, $5.00; W. P. Spring, third, $3.00. Inquiries may be addressed to Dr. Mary Whetstone, 408 Nicollet avenue, Minneapolis, Minn.

REGULATIONS GOVERNING THE AWARD OF PREMIUM OF $1,000 FOR A SEEDLING APPLE TREE.

(Offered by the Minnesota State Horticultural Society.)

1. The tree must be a seedling and entered for competition with the secretary of the society by the owner of the original tree, or by such other person who has acquired the necessary right. The entry must be accompanied by a full description and history of the tree in duplicate (one copy to be filed with the secretary and the other transmitted to the chairman of the awarding committee), stating as far as possible:

a. From what seed it was grown.

b. Its location.

c. Its age.

d. Its size and shape.

e. Whether it has ever blighted or sun-scalded, and if so when and to what extent.

f. Whether it has ever been injured by the winter, and to what extent.

g. Whether it has ever received injury from any other cause and what.

h. In what years it has borne fruit, and the amount of the crop.

i. The size, color, shape and quality of the fruit.

j. The length of time the fruit has kept, and under what conditions.

k. What care the tree has had and is now receiving, as to cultivation, manuring, protection from winds, from winter, from sun-scald, etc.

l. Whether the competitor is willing to send scions from the tree for trial to the trial stations of the society under the personal promise of the superintendents of the stations (the society not to be held responsible) not to part with them without the owner's consent.

m. Whether the tree has ever been propagated, and if so by whom, when and to what extent.

n. Whether grafts of the variety have ever borne fruit, and if so stating all the facts in relation thereto.

2. Each competitor must furnish to the Minnesota State Experiment Station, for trial, scions from the tree entered.

3. The tree must be as hardy as the Duchess of Oldenburg.

To test its hardiness as compared with this variety the original tree must have been growing and bearing under similar circumstances as the Duchess (to be decided by the awarding committee) for a period of not less than ten years, and to have passed through at least one so-called test winter; also grafted trees of the variety must have been in bearing not less than five years in not less than ten places, widely distributed in such different parts of this state as the Duchess is found doing well in—the trial stations of the society being considered suitable locations for such test, though not restricted to them.

4. The tree must be as prolific a bearer as the Duchess of Oldenburg. The certified record of the original tree, and also those of the ten grafted trees referred to, will be required in determining this point.

5. The fruit must be equal in size, quality and appearance to that of the Wealthy.

Not less than a peck of average fruit from the original tree must be sent to the chairman of the awarding committee from the first crop after making entry, and by him distributed to the other members of the committee for testing with the Wealthy as to these points.

6. The fruit must keep as well as that of the Malinda, which will keep in an ordinary cellar, under ordinary conditions, into March without deterioration.

Samples sent to the committee referred to under (4) shall be kept in ordinary cellar conditions and tested in March as to keeping, as well as to quality, at that time.

7. A plate of the fruit must be shown at each annual winter meeting of the Minnesota State Horticultural Society from the time of entry until the award is made, unless excused for cause by the chairman of the awarding committee.

8. Any seedling tree and its fruit, meeting all these requirements satisfactorily, as provided for in the above regulations, before receiving the award shall be visited and examined personally by the awarding committee while in bearing.

9. In all decisions reached by the awarding committee a majority shall decide, except in making the final award, which shall require an agreement of at least four out of five of the members of the committee.

10. The awarding committee shall consist of five members to be appointed by the executive board of the society, and shall be a permanent one, with the power of removal for cause by the executive board; vacancies in the committee from any cause shall be filled by election by the executive board at its first meeting thereafter.

11. After making entry with the secretary all further communications on the subject by the person making the entry may be addressed to the chairman of the awarding committee.

12. The committee shall keep a record of all its proceedings and report to the executive board whenever called on, and to the society at its annual meeting.

A. W. LATHAM,
Sec'y.

Minneapolis, Minn., Oct. 1, 1899.

EVAPORATION OF DORMANT TREES.

The chief factor which defines the areas of the profitable growing of fruits and fruit trees, as is the case with all agricultural crops, is climate. The main factor of climate is temperature. The fruit growing area may be divided into climatal fruit-zones, bounded by the isotherms, or lines of equal temperature.

The second important factor of climate is moisture. The fruit growing area of the United States, may be divided into three zones by the isohyetals, or lines of equal rainfall, the Atlantic zone, bounded by the Mississippi river on the west, the plains zone, extending westward to the mountains, and the Pacific zone. The Atlantic zone is quite moist, while the plains and Pacific zones are comparatively dry. The plains zone, in which we live, is perhaps the most trying to fruit trees, on account of the hot, dry winds of summer and the cold, dry winds of winter, which cause excessive evaporation through the bark. Serious injury to trees is very liable to occur in winter, because evaporation goes on when the ground is so deeply frozen that the roots cannot supply any moisture.

The extent to which evaporation takes place through the bark of dormant trees may be determined by experiments. A series of such experiments have been commenced at the state farm, by Mr. Cutting and myself, only one of which has as yet been completed. The experiment is as follows: On November 7, four twigs were cut from an apple tree in the orchard and brought to the laboratory. They were then shortened down to about a foot in length, the object of this second cutting being to leave as little time as possible between the cutting and the weighing. The cut ends were then immediately dipped in melted paraffine to prevent evaporation, except through the bark and buds. The twigs were then weighed and put in a place as much exposed as the tree from which they were taken. They were weighed at frequent intervals for one week, and a record kept of the losses from time to time. They were as follows:

Twig No. 1: original weight, 5.357; loss in 24 hours, 10 centigrams; in 54 hours, 17 centigrams; in 78 hours, 25 centigrams; and in one week, 43 centigrams. Twigs No. 2 and 3 showed similar results. These three twigs were all of the last year's growth. The average loss in these twigs was about eight per cent. of the original weight. Twig No. 4, was cut from a branch three years old. Its loss was only very slightly less than that of the other twigs in proportion to the bark surface exposed, but this slight difference was probably due, in part at least, to the greater number of buds in the

twigs of the new growth, through which evaporation would take place. From these results it may be interesting to calculate how much moisture a tree loses in winter. The apple tree from which we took these twigs is twelve years old and six inches in diameter through the trunk. It exposes about 120 square feet of surface and, evaporates about 13.5 grains of moisture per day, which is a little more than one gill. This may then explain why it is that some trees are injured during very dry winters. It is a known fact that trees which cannot endure our climate thrive farther east, where the temperature may be the same, but where the climate is more moist. Therefore, the more dry the climate, the more susceptible are trees to injury. The time that there is most danger from this source is during several days of continued freezing weather, when no moisture can be supplied from the roots to take the place of that lost by evaporation.

It has been noticed frequently that during very cold weather in winter the twigs seem somewhat duller than usual, and sometimes tend to become shriveled in appearance. After a few days of thawing weather, they resume their normal appearance again. This is no doubt due to the fact that during a thaw the equilibium between the sap in the tree and that taken in by the roots is maintained, so that as fast as moisture is evaporated from the twigs and branches sap flows up from the roots and re-establishes the equilibrium.

It has been thought that the rate of evaporation from trees in winter determines the relative hardiness of different varieties of apples and some other fruits. But experiments, made at the Cornell experiment station, with several varieties of apples of different degrees of hardiness, show that no such relation exists between the per cent. of loss of moisture and the hardiness of the varieties.

Studies have also been made at Cornell to show that the tenderness of some trees in dry winter climates may have been due to such an anatomical structure of the bark as cannot resist evaporation, and that hardiness is sometimes simply due to a thickness or denseness of the bark. The experiments seem to prove this to be true in some cases, but the investigations have not been carried far enough to give any definite results.

WILD FLOWERS FOR THE GARDEN.—When planning for the early flower garden do not forget the wild flowers. Select a moist, shady spot, remove sufficient earth and fill in with carefully selected leaf mold from the forest. Fringe the bed with pretty maidenhair and other small ferns, fill it with spring beauties, anemone, wild hepatica and violets.

The spring is the best time to make a wild flower bed, but as the plants are more hardy than cultivated ones, little difficulty will be experienced in their safe removal at any time if taken up with a ball of earth adhering and kept well watered and shaded.

THE LARGEST CROP OF STRAWBERRIES WITH THE LEAST LABOR.

JOHN EKLOF, STOCKHOLM.

To make strawberry growing profitable when prices are as low as the past season, it is required to reduce the cost of production. It is hard to improve on the methods now pursued, as nearly all the work will always have to be done by hand. The manner in which the bed is covered in the fall differs greatly with the different growers, and in this part of the work a good deal of labor can be saved under favorable circumstances.

Now, for many years I have placed the straw stack near the strawberry bed, and after the first fall of snow, if the ground is frozen, I haul the straw over it with team and a pole, in the same way that straw was formerly removed from the threshing machine. The snow will prevent the pole from injuring the plants. It is more essential to have the plants heavily covered for the thawing and freezing in spring, than to cover early in the fall. I attribute my success in strawberry growing to the heavy covering of the bed and also to leaving the covering on as late in the spring as possible.

The manner of setting, cultivating and training the plants is done in the same way as is done by many of the fruit growers. The plants are set out usually from the first to the twentieth of May, in rows four feet apart, and plants two feet apart in the row, and trained to a matted row two feet wide, leaving the cultivated space two feet wide. The bed is fruited two years.

Wood ashes from a near-by creamery are liberally used for fertilizing the ground before planting, and also when renewing the old bed. Although some recommend to not cover the bed the second year, I have always covered mine, as the mulch greatly retains the moisture. The fruit is thereby increased in size and is more free from dirt.

Mr. O. C. Gregg: This last paper brings to mind the system I follow, which I supposed was purely a farmer's system. In regard to this system of abundance of straw, I got a suggestion from Prof. Green and got something of a neighbor; I put both together, and the result has given me a great deal of satisfaction. I think where this plan is followed of using abundance of straw, if the rows are placed six feet apart the grower would be better pleased. I should put them even wider than that.

After the usual work is done, the covering is put on in the fall. The last letter from home tells me the man is going to cover the strawberry bed. Our berries are free from dirt, as we leave some of the straw right on the rows, and the plants make their growth right through it, and we have no bare ground.

Mr. Hartwell: When do you remove the straw?

Mr. Gregg: After harvest, about August. Then we cut back the tops of the plants and rake the whole thing clean and put on ashes, and the plants make a strong growth. When the ground freezes, we put on the straw, and it is all the work we have to do.

Mr. Hartwell: How do you cultivate?

Mr. Gregg: We use surface cultivation altogether.

Mr. C. L. Smith: You put straw on the rows and then uncover it the next spring?

Mr. Gregg: We put about four inches of straw on the rows, and we put it in between the rows in the spring time. One of the great dangers in strawberry growing is the frost in June. We let that straw stay on the plants as long as we find the crown is bright, and if we find the crown is getting white we rake off half of the straw and let the plant come right through. It looks nice and tidy. I heard a man say the other day, "That man Gregg is employed by the state; he can afford to do that." Why, bless your heart, that is just where I have to economize; labor is what costs; that is my biggest expense. I stand here to say that I can raise a peck of strawberries as cheap as you can raise a bushel of potatoes, but I want somebody else to pick the strawberries.

Mr. R. A. Wright: Do you have any trouble with the grain coming up from the straw the next season?

Mr. Gregg: One year I was a little careless, and we had some trouble. I now take old straw and then, possibly, shake it up a little bit. If I had it handy I would put marsh hay between, but I would not put it over the plants; it would smother them.

Mr. C. L Smith: I want to take exception to that statement. I have been growing strawberries for about thirty years, and many times I have used slough hay, but I have never had a strawberry smother They did not smother last winter or the winter before, and they were covered eight inches deep. The question is asked, what time do you take the covering off? Look at your plants and as long as the crown keeps all right leave the cover on, but when the crown begins to grow take off enough of that mulch so the plant can come through. You cannot tell whether it is the tenth of May or the twentieth, or the first of June, but as long as the plant remains dormant, leave the mulching on. But when it starts to grow take off the mulching.

Mr. Gregg: We use a great deal of straw between the rows. We hold the plant back as long as we can, but we have late June

frosts,and then we go over the beds—and we can do it so nicely—we go through with the fork and throw the straw right on top of the bed. My man said to me the other day, "I can protect the strawberry bed about as quick as I can bed down old Jack." When the cold period passes we take it off.

Mr. Hartwell: What would you do with six acres?

Mr. Gregg: I am talking as a farmer only.

Mr. C. L. Smith: I have tried every method to prevent frost I ever heard of, and this method Mr. Gregg speaks of is the only practical method I have ever found or tried, and it has never failed up to this time. I have tried all the other methods, smoke, building fires around, burning tar and methods of that sort, but I never succeeded in keeping the frost off except by the use of straw. If I had six acres I would hire enough more help to put it on. If you have your straw piled along the rows one man can cover a half acre before midnight, consequently you would need a dozen men to do the work in good shape. It will not hurt the plants to leave the covering one or two days or until the cold spell has passed.

Mr. Sargent: Is there any advantage in keeping the plants back? Will not the early berries bring the most?

Mr. Gregg: We do not consult the market at all. We only have reference to our home market.

Mr. C. L. Smith: As far as early berries bringing a good price is concerned, we would like to avoid the early berries, because at the season when we get early berries here we get the dump from Wisconsin, and there is a decline in prices until the 4th of July, and the further back we can keep them the better prices we get.

Mr. Sargent: Down at Red Wing they get filled up and do not want any more.

Mr. Richardson: Our experience at Garden City is that the last ones are the only ones that pay.

Mr. Taylor: The last berries we pick are the most profitable. In covering I use straw, but I get it from the stack on the side most distant from the machine and in that way avoid getting seed. I have my rows five feet apart, and I don't know but what I will put them six feet.

Mr. Hartwell: If the grain starts up I take a scythe and mow it off.

Mr. D. T. Wheaton: About how much hay or straw will strawberries grow through?

Mr. Gregg: They will grow through two inches at least.

Mr. C. L. Smith: A half inch of slough grass is about as much as they will climb through.

Mr. Wright: My experience with straw has been that the wheat will come through. I have to buy it and take it where I can get it. I had one part of my bed practically smothered out. I did not mow it off—I tried a little of it. I now use slough hay and that gives me the best results. It is clean in every way, and I also use it between the rows.

Mr. Gregg: You like the system of mulching?

Mr. Wright: Indeed, I do. I could not get along without it. I have been trying to grow strawberries for five or six years, and this is the only year when I raised strawberries that I made them pay.

Mr. Ellergodt: I had the best success in burning the mulching. My practice is to run the mower over the strawberry bed and cut the tops off and then burn off the bed.

Mr. Hartwell: That will do if you have a quick wind.

Mr. Ellergodt: Oh, no, that makes no difference; sometimes I go over it a second time.

Mr. C. L. Smith: We always have wind enough in Minnesota. (Laughter.)

Mr. Ellergodt: I have succeeded very well every year, and I get no weeds.

Mr. Hartwell: That matter of burning has another good point; we get rid of the leaf roller.

Mr. C. L. Smith: Sometimes it destroys the roots, and sometimes it is all right.

The President: Some of you are talking about raising strawberries under very different conditions from Mr. Gregg. He is talking for the frontier out there on the couteau, where farmers have any amount of straw to burn, where they can have plenty of straw to mulch. This is a very valuable lesson for this society to promulgate and teach to those farmers out in the prairie country. They do not know how to grow anything except hogs, wheat and corn. They do not know how to furnish their tables with strawberries, and if they could get at this idea of growing strawberries for their tables, as it has been proven it can be done, then I think this is something of practical value that farmers want to know.

Mr. C. L. Smith: That is just the point; that is the reason I spoke of the slough hay mulching. This matter is all to be printed in our report, and we do not want to make a mistake. On the western prairie, on the dry prairie with an abundance

of straw, do just as Mr. Gregg does. He is doing the best of anybody in the state. I consider his method the safest, the easiest and surest for getting a crop of strawberries of anything I can find. The reason I spoke of slough hay is this: I know that slough hay can be used without smothering the plants, and I know there are thousands of farmers who are going to plant and who have planted, but who have got no straw, nothing but slough hay, and I know that that can be used and used safely. I know for every farmer who has the straw as Mr. Gregg has, the method suggested by him is the very best that has ever been produced.

Mr. Dewain Cook: I live in the western part of the state, where we have plenty of straw and slough hay. I use slough hay, and I have never lost anything by smothering. I look at the matter mostly in the light of economy in work. We need considerable protection for strawberries, and the matter of a foot or two feet between the rows does not count much when grown for home use, but when grown for market I think it is better to set the strawberries in a sheltered locality, and then a light mulching will be sufficient. I also agree that the mulching will hold them back in the spring; but there is no necessity for mulching after the first winter, and I think, especially in some years, if you let the old beds go without mulching you will find the weeds sufficient for that purpose.

Mr. Gregg: Let me state the case from the farmer's standpoint. I keep careful track of the work that is done; that is the big expense account. I put this straw on the bed when other labor is not pressing. We are taking care of our stock now. My man just wrote me that they would mulch the strawberry bed pretty quick now, as they could do it between the chores. When that work is done, it answers for the work I would have to do next spring and summer when I am so busy. Another point: it is free from weeds and there is no call for work when I am busy with other things. So I call it the "farmer's system." I have in the institute room spoken strongly of the system; my neighbors are taking it up, and it is the system for the farmer to use.

Mr. Wedge: I think it has been stated several times in our society that there was no danger in burning off an old strawberry bed; that that was the way to renew it for the second year, to mow off the tops of the plants and burn them. I had experience one or two years and very good success. This year I went at it with a great deal of confidence, burned off one

patch and completely ruined the bed. The fire went too deep and completely destroyed the plants, leaving not more than two or three plants to the rod. So I would say there is some caution necessary in burning off a bed.

Mr. Wright: I had the same experience. This year I considered it too dry to burn the strawberry bed, so I mowed it and raked it with the horse rake. It was a tedious job, but I believe it paid me better. I was afraid of fire.

Mr. Hawkins: I am a farmer and I do not think it is advisable to recommend to farmers this practice of burning strawberry beds. He would burn it out five times out of six.

Mr. Taylor: I mowed one patch and burned the other, and in the one I burned there are very few plants left.

VICE PRESIDENT'S REPORT, SECOND DISTRICT, FOR 1898.

S. D. RICHARDSON, WINNEBAGO CITY.

Generally speaking, the crop of fruit of all kinds was good in this district. In some places, near the woods, the worms had been very bad in previous years, and the apple and plum trees did not have vitality enough left to blossom. With that exception there were plenty of apples wherever there were plenty of trees. Wealthys brought a fair price in all parts of the district. Other kinds brought a fair price in some parts where there was a scarcity, and in other places one could not give them away, and they rotted on the ground. Some persons bought cider mills and made the surplus into cider.

Plums set very heavily in many places, but the plum pocket ruined some kinds entirely, and the rot and curculio hurt other kinds, but some trees still carried so many plums that the dry weather made them small and almost worthless. Judicious thinning and proper cultivation would have remedied this.

Cherries were good except where there were heavy rains when the trees were first in bloom. Plenty of Russian mulberries and our small native red cherries will keep the birds busy so that they will let the tame cherries alone. Raspberries were a light crop, and so were blackberries. The reds mostly winter-killed; the blacks were good in some places, poor in others. With the exceptions noted, the crop of small fruit, of all kinds, was good.

The fruit list of the society I would recommend for adoption in our district with the following addition: the Wealthy succeeds well in all parts of the district when grown with a very short body —from nothing to two feet—and has so far proved by far the most profitable variety when grown for market.

A LITTLE OF EVERYTHING IN SMALL FRUITS.

FRED E. CUTTING, MINNESOTA SCHOOL OF AGRICULTURE.

This subject summarizes what I am growing on one and a half acres of ground at my home, in the southeastern part of Minnesota.

I began raising small fruits three years ago, securing at that time about half an acre of currants, gooseberries, red and black raspberries and blackberries.

Currants and gooseberries bring a low price in my home market, gooseberries selling for five cents a quart and currants for five to seven cents, but they have been my surest and most profitable crop, considering the small amount of labor required to grow them. I secure good crops of currants and gooseberries by pruning the bushes early in the spring, then heavily mulching the ground between the bushes so as to keep the ground moist and prevent weeds from growing. I give them no other care, except to spray them with white hellebore to destroy the currant worm. The past season (1898) currants yielded at the rate of over one hundred bushels per acre, and the last two seasons gooseberries yielded at an average rate of one hundred and seventy bushels per acre.

The market is limited at present, but there is a noticeable increase in the demand each year. I market currants in quart boxes and gooseberries in bulk.

Red raspberries are in greatest demand in the market which I supply, therefore I grow them more extensively than the other fruits. The varieties which I have grown are the Turner and Loudon, having secured two plants of the Loudon the first year it was offered for sale, and increased the planting each year since. It is the best red raspberry I have seen, being large and firm, and the bushes hardy and productive.

I have the Nemaha and Palmer black raspberries. The Nemaha is large, firm and productive, making a good raspberry for home or distant market. The Palmer is doing well for early market.

The Golden Queen yellow raspberry is very desirable for table use, and does well for a canning berry, only that it loses its beautiful pinkish color somewhat when cooked.

The Snyder and Ancient Briton blackberries yielded a good crop in 1897, the Ancient Briton bearing the heavier. During the winter of 1897 8 both varieties were injured, the Ancient Briton not bearing any fruit the past season (1898), but the Snyder, seeming to be hardier, set some fruit, which did not mature because of the dry weather.

I had an unknown variety of blackberries which yielded good crops of large berries, but of such poor quality that a person would not care to eat them a second time; so I dug them out and planted Loudon red raspberries in their place. I set out a thousand strawberry plants in the spring of 1897, and they made a good growth that season but were injured during the next winter because of not being covered, and the crop was nearly a failure. I have about one-third of an acre of strawberries set out now, for fruiting and growing plants, consisting of Bederwood, Warfield, Enhance, Crescent and Haverland.

On this acre and a half there are also twenty-five apple trees, some plum trees and grape vines, all of which will soon come into bearing.

I have found cultivation to be better than mulching for most fruits, especially for the first few years after setting, but after they get older it is a good plan to mulch close to the plants and cultivate between the rows. Some red raspberries were mulched and not cultivated for the first two years after planting, and they made a very poor growth, but the last two years they have been cultivated and made a good growth.

The past season I used a fourteen-tooth horse cultivator, which did very good work in strawberries and other fruits, except where weeds or suckers got quite a start, in which case a five-shovel cultivator was used.

I have given the raspberry and blackberry bushes winter protection by bending them to the ground and covering with enough dirt to hold them in place, so that the snow could cover them, but the past winter there was not enough snow to cover them, and they were injured.

I have not been troubled much by diseases or insects. The currant worm appears every season but is easily destroyed by spraying the bushes with white hellebore, used at the rate of a teaspoonful to a gallon of water.

The snowy tree cricket did some damage by laying eggs in the raspberry canes, which would cause them to break when they were bent over to be covered. The remedy for this is to cut out and burn the affected canes.

Next spring I expect to plant more of each kind of fruit and also to increase the nursery which I started in a small way last year.

I have always been interested in the study and practice of horticulture, and my interest and knowledge of the subject have been much increased by attending the School of Agriculture.

CULTIVATING THE STRAWBERRY.—As soon as the strawberry bed is planted use a drag tooth, adjustable cultivator, going twice in a row and as close as possible to the plant The bed is cultivated on an average once every ten days throughout the growing season, twice in a row until the runners start freely. After this the cultivator is run but once in the row, always going the same way and gradually narrowing up the cultivator until it is not more than a foot wide. By always cultivating the same way the runners are pushed in one direction by the cultivator and little or no hand training is needed. After every rain the bed is cultivated to create and maintain a 2-in dust blanket, which will prevent, to a considerable extent, the evaporation of moisture. All fruit buds are picked from the growing plants. In order to have the best success, the space between the plants must be kept absolutely free from weeds. The final cultivation is given the last of September, by which time, if the season is an ordinarily favorable one, the rows will be 18 inches wide, filled with vigorous, healthy plants.

PLUMS IN SOUTH DAKOTA.

OLIVER GIBBS, JR., PRESCOTT, WIS.

In the season of 1886 I had a revelation in plums, there being a great many wild ones in all stages of growth on my place. With the apple trees brought from the Jewell Nursery and planted in the spring of 1896, were a few De Soto plum trees top-worked on the native stocks common to Minnesota. These were to be my main reliance for plums, as I supposed, unless Prof. Budd's Russians should prove valuable. In the spring the masses of bloom from the wild plums, standing in thickets all around us, and their delicious perfume, were a delight that of itself would seem to repay their protection, and I was filled with remorse for some work I had done among them with the axe the previous winter. But when their fruit ripened in August and September we found we had a California of our own, ready-made for us. Nature's own cunning hand had done it all—climate, soil, distribution, growth, everything just right, needing only a little help from man to repair his own disturbances of the balance of nature, such as fencing out cattle and destroying tent caterpillars, left to breed when the birds had been killed off or driven away. There were plums ripening in succession for six weeks, large, showy plums for hand eating and for dessert, plums for jelly, for canning and for plum butter, plums soft for near market, but bearing delicate handling well, and other plums for distant shipping if necessary, plums that the local market wanted at $2.00 per bushel and could never get enough of when offered in good condition, in attractive packages—plums that will today outsell the California plums in Minneapolis and St. Paul and anywhere else this side of the Rocky Mountains where they are known; and these plums are common to all South Dakota (not local prodigies) and will do well if intelligently planted and cared for on any farm in the state.

In 1887 and in subsequent years I made efforts on a small scale to increase my stock of plums by transplanting from the thickets, by growing seedlings from pits of the best sorts and by top working. All these methods succeeded fairly well, and for several years past we have had good pickings from these new trees. I could not tell without further trial whether any of them are better than those I had before, although these are quite promising, evidently crosses. In some cases there are close reproductions of varieties, enough so to satisfy me that by careful attention one could secure a good plum orchard from pits alone. The trees themselves I think will be better. Inferior seedlings may be top-worked. Any farmers' boy can do this with a little instruction, which he can get from a twenty-five cent manual on fruit propagation and culture if he has nobody to show him how, and I know no cheap book of this kind that is better than Prof. Green's "Amateur Fruit Growing."

The sexuality of plum blossoms must be carefully studied. They are very much like the strawberry in that respect, some perfectly bi-sexual, many imperfectly so, and perhaps others entirely pistillate. Of this we are sure: some, the De Soto for instance, are perfect in bloom, strong, independent, good pollenizers for their own

and neighboring bloom; others, and of these are some of the very best in fruit, are shy bearers unless they get pollen from their neighbors. Now the pollen is not supposed to carry alive in the wind more than twenty feet: this suggests close planting, for the insect pollen carriers may not always be on hand to do the work. The safest way for the beginner is to plant the varieties known to be perfect in bloom, like the De Soto.

It is worth the while of any farmer having an inclination to horticulture to spend several years' time or a life-time experimenting with and studying the native plums, as an occasional bracer to his moral constitution and for the comfort and love of home of his family. This is a trite remark, which will apply equally well to other native fruits and to the orchard and garden in their many particulars.

If there is a chicken fence to be put up, let it enclose the plum orchard for protection from insects injurious to the plum, and be sure to let the chickens run there early in the spring. But keep the pigs out of the plum orchard. They will destroy the roots.

THE COST OF BRINGING AN ACRE OF BLACKCAP RASPBERRIES INTO BEARING.

L. P. LORD, OWATONNA.

The cost of bringing into bearing an acre of blackcap raspberries varies and depends in each and every particular upon the manner in which the work is done and the cost of material and labor. Although I have only 2,000 plants, I will estimate the cost of an acre from mine.

The better the land, the less the cost of raising raspberries. First comes the cost of plowing, which will cost $1.25; then a thorough harrowing, which will cost fifty cents. I set my plants in rows six feet apart and three feet apart in the row. A furrow was plowed for each row, and with a three foot marker run across the furrows at right angles intersections were made, at which places the plants were set. This can be done for fifty cents.

By planting as above, it will take 2,400 plants. I paid $10.00 per 1,000 for mine, or $24.00 per acre.

I found that the most desirable way to set the plants was to have one man drop two rows at a time, and two men follow and set them. Three good men will thus set out 2,400 plants a day, at a cost of $3.75.

At a cost of $5.00, an acre of blackcap raspberries can be properly cultivated and trimmed the first season.

The following season $2.50 will keep the field in good condition until picking time. Under favorable conditions the plants should bear much fruit the second season. I prefer mulching the second season, as this conserves the moisture and keeps down weeds.

This makes a total cost of $37.50. Plants are to be bought cheaper now, and by supplementing men's labor with boy's labor the cost is perceptibly reduced.

ORNAMENTAL TREES AND SHRUBS.

REV. E. D. COWLES, VERMILLION, S. D.

(Read before the South Dakota State Horticultural Society, Yankton, S. D., December 15th, 1898).

In drawing the line at ornamental trees, I find myself lost before I begin, for there is the cottonwood standing about two miles from where I live that has had the privilege of spreading itself at its own sweet will, with no other tree to crowd, and not even the grass has been allowed to grow under it, and, growing in a cultivated field, it is truly a thing of beauty. I seldom go to town that I do not look up and admire the graceful forms of the soft maples standing by the roadsides; they having resisted the drouths and blasts for fifty years. So we will begin with a mention of those trees that have proved themselves worthy as shade and ornamental trees upon our lawns. You will notice that I speak of our experience at Vermillion and in Clay county rather than of the state.

The white, or water, elm has proved itself a drouth resister, it having lived and kept green when even the box elders and black walnuts died in the same grove. The red elm makes a more graceful tree but is harder to propagate. The rock elm, if planted, we believe would resist more dry weather than the ash. Box elder is the standby, though at Vermillion we like the soft maple better. I wish somebody would propagate the hackberry, for no one would ever regret placing one in his lawn. The man who plants a linden, or basswood, gives himself a thing of beauty, fills the air with a beautiful aroma and feeds his neighbors' bees for many days. The Kentucky coffee tree makes a fine head when set alone.

So much for the natives, and if the shipped-in trees beat the natives for beauty or ornament they will do better in other parts of the state than they have at Vermillion. We will mention those that have succeeded with us. The catalpa by lots of petting makes a fine tree but is not hardy any distance from the Missouri river. White birch and European alder do well with us in low places. Black cherry makes an imposing tree but is rather large for ornament. We have one sugar maple doing well. The mountain ash will live and in a low, rich places gives very satisfactory results, and the European larch the same. Some one set some European lindens in Vermillion, one of which is making a beautiful tree. The trees purely for ornament are the evergreens, the weeping trees and those that will bear trimming.

The Scotch pine surely is our leading evergreen, with the Black Hills spruce a close follower. The most admired tree in Vermillion is a concolor spruce, brought from the Black Hills, by Mr. Fargo, a few years ago. White pine does fairly well in a grove, but has not proved itself a worthy lawn tree with us. Austrian pine grows nicely if cultivated. The Black Hills pines are doing fairly well in other parts of the state but have not been tried at Vermillion. Norway spruce, though we have a fine tree in our flower garden, we would advice no one to plant.

White and blue spruce can be recommended for planting as ornamental trees. Of the balsam fir we bought fifty trees, grew them in the shade for a few years and have succeeded in getting one tree to live and grow where the sun shines. The white cedar, though it seems to do well at Sioux Falls, no one has succeeded in making a presentable hedge of at Vermillion. The red cedar is the only native evergreen in the southeastern part of the state and is not grown half enough. It is hardy, a fairly good grower, a drouth-resister and will bear trimming.

Among the weeping trees tried here Kilmarnock willow will not stand, but we have some fine trees of the Wisconsin weeping willow. Our camperdown elm is about eight feet across, but no taller than when we got it four years ago, and forms the finest shade for a pansy bed imaginable. An agent sold twenty or thirty weeping mulberries in Vermillion, but when they saw this beautiful country and the big crops that we raise here they said by their actions that this is no place for weeping, and they grew as straight as cottonwoods. The cutleaf maple and cutleaf birch are inclined to do the same.

There is a weeping mountain ash at Sioux Falls, the envy of every horticulturist who sees it, trained "into a rustic seat under a bower."

The evergreens all bear shearing more or less, but the cedar bears it much better than the pines or spruces.

The most perfectly dwarfed and pruned trees that I have seen in South Dakota are the Russian mulberry, being ten years old and only four feet high, compact and healthy, carved in the shape of square blocks, eggs and inverted cones.

The ailanthus (specimen sprout shown), we would class as an oddity, the root being hardy, but the top killing down year by year. So we cut it down close to the ground in the fall, bury the stump and train to a single sprout in the spring. The leaves on this sprout, some of them, were over three feet long, a single pinnate.

For shrubs the lilac takes the lead. Philadelphus, or mock orange, is perfectly hardy. Snowball is hardy, but the drouth hurts it. Japan quince is hardy but a shy bloomer. Quite a number are putting in either the wild or Soulard crab as a flowering shrub, its profusion of peach-like blossoms giving it a beauty far surpassing many of the so-called flowering shrubs. The flowering almonds are hardly hardy enough to pay for cultivation.

Did you ever see any one who did not love the flowering currant? Perfectly hardy, almost the first flower of spring, deliciously scented, and yet we either have to send back to mother, or get a chance to beg one, for our nurserymen seem to forget in their strife for something new that some of the old favorites are the best after all. The bush honeysuckle is worthy of a place in your dooryard, though in all my travels I have seen but one. The red snowberry makes a beautiful hedge, and a garden is very incomplete without some spiræas; the Van Houttii does very well with us. The late flowering spiræas, both pink and white, have a very delicate bloom.

The new plants lately introduced by Professor Hansen from Russia are doing well with us.

Among the native shrubs worthy of cultivation, the common sumach makes a very pretty hedge by mowing down every fall.

Sheperdia, with its silvery leaves, contrasts finely with many of the darker leaved shrubs. Euonymus, or strawberry tree, is quite ornamental with its red berries hanging on all winter. The kinnikinnick, or red stemmed dogwood, makes a pretty sight in early spring, especially if there is golden willow near it.

POTATOES FOR THE MARKET GARDENER.

FRANKLIN DE COU, ST. PAUL.

The prominence which Minnesota butter has given to Minnesota should be a stimulus to every other agricultural or horticultural industry to perfect itself and be abreast with, if not in the lead of, the sister product. I am inclined to think that no better potatoes are grown anywhere than in Minnesota, and should we who grow potatoes use care in selecting varieties suited to our soils, and the most promising of these varieties, we could soon place our potato crop in the market as seed potatoes, thus commanding a price above the average merchantable potato. But after this selection of varieties, time and mode of planting, culture, harvesting and storing must follow with equal care and patient persistence.

For a money crop, the potato stands a little above the average when carefully, continually and intelligently followed up. The early potato has our preference, especially for the market gardener, whose interests we are supposed to champion today.

Plowing early is one of the necessities. If sod ground is to be planted, and preferably clover sod, August plowing the previous year is desirable; for if in sandy land the ground settles and rots the vegetable matter, making it available for plant use, the nitrogen of the clover being particularly beneficial to potato growth; if clay land, the freezing and thawing of winter renders the land friable and much better suited to early planting and adapted to potato culture. But all fall and summer plowing has this objection, the great loss of nitrogen during the winter. We have sometimes covered a piece of plowed ground with tomato vines or straw in the fall, and could see the following season the improved growth of plants on these spots through the whole season, especially should a drouth intervene between planting and harvesting.

But to get our potatoes planted: It is supposed this land is fairly fertile, but it should be aided by an application of 400 pounds of guano or 600 to 800 pounds of bone meal to the acre in the row—but do not let the seed come in contact with the guano.

The ground being plowed early, dry enough to harrow nicely—do it thoroughly—then level, pulverize and make compact to withstand drouth. If to be planted by hand, make the furrows two feet eight inches apart and eight inches deep, with a one-horse plow, the rows running north and south. Leave the rows open for a day in the sun to warm up, unless the season has been favorable for warming and drying.

For two seasons we have planted our potatoes with an Aspinwall potato planter with very satisfactory results. Then the marking, opening furrows, dropping and covering are done in one operation.

Cut the seed as planted, two eyes to a piece, with plenty of potato for the plant to feed upon until roots are formed strong enough to supply nourishment to the plant; that is, if potatoes are the size of large hen's eggs, and the eyes are fairly well distributed and cut into quarters. But the preponderance of eyes on the seed end, as it is called, makes cutting scientifically a difficult matter. Eyes in the stem end are the last to start; hence, for especially early selection the seed end only should be used. Should the seed be scabby, soak in corrosive sublimate solution after cutting. Formaline has not proved satisfactory with us.

Drop the potatoes fourteen to sixteen inches apart in rows in rich land, twelve inches apart in poor land. Take a one-horse plow, hold on the mould-board side and cover the potatoes from three or four inches deep, enough so to insure against frost and drying out. This will be more likely to start potatoes early, giving the land a chance to get warm, the heat coming from above, and the depressed furrows keeping warm and moist, being below the sweep of the winds.

As the potatoes are starting through the ground, harrow across the rows to further cover potatoes and kill germinating weeds. Again in a week or ten days repeat the harrowing, using a slanting tooth harrow, and the land will, or ought to, be nearly level and the potatoes well above the ground. This harrowing should be repeated every week until the potatoes are four or five inches high. If harrowed a warm afternoon when the vines are wilted they will suffer but little from this apparently rough treatment, and many little weeds will be destroyed, and thus hand labor will be avoided, which labor is very destructive to the slender profits in these times of low prices.

Horace Greely, when once addressing the farmers at a county fair, remarked: "I suppose you have all got past the folly of hoeing corn"—when he was greeted with "no, no!" "Well," said Horace, "you can't afford it."

Neither can we afford to hoe potatoes, nor do we need to if the harrow is kept going and followed by the light cultivator or sulky plow, hilling as little as possible. Hilling will do if the season be wet, but for dry seasons level culture and frequent is the more desirable.

The potatoes through the ground and harrowed need at once the attention of the sprinkler. Paris green seems the most efficient in destroying the bugs, one teaspoonful to a gallon of water, and this is made more effective if first mixed with rye flour and made into a paste, then dissolved in the water. An attachment is now made for sulky plows, the Paris green being mixed with land plaster and then distributed by that patent attachment while cultivating, thus saving all extra labor. The land plaster is beneficial to the potato in absorbing nitrogen from the air and giving it up to the potato plant. For applying with water various devices are used. A barrel on wheels with a horse attached is used for large tracts, four pipes with sprayers leading from the barrel. Bordeaux mixture may be applied at the same time, thus preventing blight.

The early market is generally the paying one. Hence when potatoes are the size of hen's eggs, if the market be high—and that is

generally the case when most farmers are too busy with hay to stop to dig and sell—the market gardener should get his potatoes to the market.

Horse-power diggers are preferable, and if we could get a horse-power picker the main labor of potato raising would disappear.

Potatoes on heavy and wet land should be dug in the morning and gathered in the afternoon in baskets and left standing filled that they may be easily and rapidly gathered and hauled either to the cellar, if cool and dry, or to a building where they can be kept cool and dark; or, if desirable, they can be put into temporary heaps of twenty or thirty bushels and covered with five or ten inches of dry straw, and then with eight or ten inches of earth, with a sheaf at top for ventilation if damp or hot. Here they can be left until freezing weather, when they may be stored in the cellar or sold. If dry, they can be kept in the cellar in heaps of 250 or 300 bushels. If disposed to rot sprinkle with air-slaked white lime. This is a safe precaution in any case.

As to size of potatoes for planting, that depends. If the crop is small, to save the little potatoes is all right for one year. That is, if there are few big and few little, the small ones have strength enough to grow another good crop under favorable circumstances.

As to color, white skinned potatoes always for a seller.

Of varieties, Bovee, Carmen No. 3, Ohio and early Ohio for early do well here. Rural New York, Carmen No. 1, Ideal, Maggie Murphy and Burbank for late. But if we could get the old Peachblow restored to its old time vigor, we would then have the ideal potato in fact.

HARVESTING THE APPLE CROP.

C. W. MERRITT, HOMER.

The subject of harvesting the apple crop, which you have assigned to me, is one of moment. Just when and just how to do it puzzles the oldest man, and yet there is not a school boy in our neighborhood but knows *just how to do it* and, ordinarily, *when* to do it.

I hardly think any two men in the state will agree upon the subject of harvesting apples. My opinion now is that for cold storage or shipment the Duchess apple should be gathered before fully ripe, while all other varieties that I know anything about will keep better if you tide them over to the cool weather in September or later. I am satisfied apples gathered in hot weather will not keep. "A writer has said that the sap in a tree limb remains at a normal temperature under a blazing sun." The apple picked from the tree is cold, but once off it soon becomes as warm as the surrounding atmosphere and must soon go to market into cold storage or rot; while if it is gathered cool, at once put in a cool place, either cold storage or cellar, it will keep much longer in my opinion—but I have'nt been long enough in the business to know it all yet.

I gather the most of my apples with the aid of a stepladder, having a basket with a wire attached to the handle that I can hook over a limb within convenient reach. I am in favor of having trees

with limbs as near the ground as possible; all my Duchess trees have bodies not more than three or four feet long at most. I have them that have borne for thirty years without a single failure, four, six and sometimes eight barrels to the tree.

Apples to keep well under any circumstances should be handled like eggs. You can bruise with the thumb in picking, if not careful, which will be as bad as falling upon the ground.

Green's Fruit Grower says: "It is not generally known that there is a class of buyers of apples, who habitually pay more for them than is paid for oranges, but such is the case. It pays to cater to this trade at any time, but in a year of scarcity it pays best. One Ohio man, who takes special care of his apples, always sells to this high class trade at prices that make his apple trees as valuable to him as any orange grove in Florida. Buyers know about this and will always pay more for such fruit, unless they can get it at going price. This rule follows with other kinds of fruit as well."

Speaking of low branching trees, I have three Malindas that the lower branches, wide spreading, touch the ground and mature their fruit in fine shape. Of the Malinda, we have found one important point: they should remain on the trees just as long as possible without freezing. A light freeze which would not effect Ben Davis in the least, will show its results on Malinda along in January, when they turn that beautiful golden yellow that says "we are ready for you." Then the effects of the cold they caught will appear. The skin turns brown in spots and looks like rot, and while not rotting it will be spongy and lack flavor. Watch the weather and the Malinda.

HARDY ROOTS UNDER HARDY TREES.

AMASA STEWART, LEMARQUE, TEXAS.

(A communication.)

I have just read Prof. Hansen's article on root-killing of the apple *(Minnesota Horticulturist, Sept. 1899).* That is a very important subject for the fruit grower of the north, and the line runs further south than the apple growers are generally aware of. I have had apples root-killed as far south as LaSalle county, Ill.

As I had over twenty years experience in Minnesota in getting a hardy stock to grow the apple on, I will give my conclusions, or success. I have tried northern seed of the apple and crab without success, but I have found when I got a hardy tree on its *own* roots, the roots *were* hardy. That can be done by layering or grafting on pieces of roots. The plan that I adopted was grafting on pieces of young thrifty seedling roots about one inch long. Whip graft and leave a bud at the lower tip end of the graft which will be almost sure to strike root the first year. Take the tree up late the first fall and cut off every particle of the seedling root and leave the roots from the graft. If there is a small portion of the tender root left, it will be likely to ruin the tree.

I would advise using scions from perfectly hardy trees as free from blight as possible. My choice for stock was the Virginia crab.

Don't spend time in raising stocks from half hardy trees.

FRUIT TREES UNDER CONTROL.

E. H. S. DARTT, OWATONNA.

(Read before the Southern Minnesota Horticultural Society.)

Men, animals and things are useful to the world according to the amount of wise control that is exerted over them. Man is usually controlled by law, whilst animals and things are largely controlled by man. He breeds the horse to his liking, halter-breaks it, gets it accustomed to the bit and harness and, lastly, obtains perfect control by the judicious use of the whip and spur.

In regard to the fruit tree, he has neglected its breeding and has seldom tried to exert any control over it, he has coaxed it and petted it, and let it have its own way until it is a deplorable question as to which is boss, the tree or the man.

In the case of the barren fig tree, he dug about it, hoping that cultivation might make it productive. Cultivation is more likely to promote wood growth than it is to cause fruitfulness. Had he girdled it also, he would have done just the right thing. By means of girdling we can secure as perfect control over the tree as we now have over the horse. We can say to the young tree: "Give us a sample of your fruit so that we can judge whether it be good or evil," and it is likely to comply with our request. We may command the barren tree to stop its foolishness and give us fruit, and it will obey. In very fruitful seasons it is desirable to have part of our trees defer bearing till the next year. To accomplish this we remove the fruit and girdle at the proper time. We also test the hardiness of the tree. Tenacity of life is measured by the amount of injury an animal or plant can receive and still live, and in the case of the tree it seems fortunate that we are now able to inflict injury to any desired degree and obtain results in a year instead of waiting indefinitely for the injury to come through the effects of a very cold winter or a very dry summer. In this climate, the first of July seems about the best time to girdle. If it is done much earlier, the wound heals over perfectly, and little or no effect is produced. The theory is that by checking the downward flow of sap, the elements of growth taken in through the leaves are held in the branches and cause the formation of fruit buds, which are developed the next season.

The work is best done with a saw, by the spiral method, starting in just below the limbs and cutting to the wood down around the tree at an angle of forty-five degrees. For a very severe test, go twice around. This will not kill a hardy tree, and a tender tree is better dead than alive. On trees and limbs one inch or less in diameter, I use a knife instead of a saw, being careful to cut clear to the wood, for it is the disturbing of the cambium layer that produces the effect. Most people believe that to girdle means to kill, and I am receiving rough treatment for advocating a practice that they say is in direct opposition to the laws of nature. While I am girdling extensively with beneficial results, I advise other people to experiment a little just to see how they like it. I firmly believe that when girdling is understood and judiciously practiced, there will be millions in it for the people.

LEGISLATURE VS. "THE TREE SHARK."

H. W. BENTON, MINNEAPOLIS.

(Read before the Minnesota State Horticultural Society Dec. 9, 1898.)

I have been asked by your honorable secretary to prepare a five minute paper on the above subject.

As I understand it, a "tree shark" is an unprincipled, smooth individual who goes around the country representing himself to be the agent of some reputable nursery and soliciting orders for trees which when they are delivered do not correspond to the trees sold, and thus the purchaser is defrauded and at the present time is without remedy.

The question now arises, how can such individuals who so represent themselves, be reached by law? It has been suggested by some that all persons soliciting orders in the state be compelled to purchase a license from the proper authorities. Upon a careful examination of the authorities on the subject, I have found that notwithstanding the license might apply generally to all persons who are residents of the state or otherwise, that it would be in violation of the inter-state commerce law, hence, it would be non-enforcible and void. It is, however, an established principle of law, recognized by the courts, that the only way in which commerce between the states can be legitimately affected by such laws is when by virtue of its police power and its jurisdiction over persons and property within its limits the state provides for the security of the lives, limbs, health and comfort of persons and the protection of property. Any state can pass inspection laws to secure the due quality and measure of products and commodities without interfering with inter-state commerce laws.

My opinion is that if there is any disease to which trees and shrubs are subject, and which disease is of such a nature as to destroy the orchards of this state, then some law might be passed by our legislature to protect the orchards of the state, and which law would in the future operate as a license, and thus the object desired would be accomplished. For instance, I learn that the San José scale is threatening the trees of this northern climate. In the December number of the Horticulturist, I noticed an article by Prof. Lugger, in which he states that the scale will propagate and grow in this climate as well as in a warmer. I am not prepared to say how serious it would be if such a disease should get into the orchards of this state, but if it is serious it seems to me that some law might be passed which would provide for proper inspection and protection, and which would also prevent dishonest agents from defrauding the fruit growers of the state. My attention has been called to such a law which was proposed but not passed by the last legislature. I am not prepared at this time to say whether the proposed law is just the thing or not, but I feel confident that some protection can be afforded by our legislature to the fruit growers and purchasers of trees and shrubs in this state.

A SUMMER IN A GREENHOUSE AND FLOWER GARDEN.

LE ROY CADY, MINNESOTA SCHOOL OF AGRICULTURE.

My work during this last summer (1898) has been at the experiment station, at St. Anthony Park. The work was general but was principally in the greenhouse and about the lawn and flower garden. As this was my first experience in this kind of work, I had considerable to learn. Early in the season the work was all in the greenhouse. This green house is heated by its own steam-heating plant, so there was first a furnace to learn to manage. In connection with heating I found that there were apparently two classes of plants, a tropical and a temperate class. The tropical class needed about fifteen degrees more heat than the other, so we had to keep the different houses at different temperatures. In one we kept palms and other tropical plants, in a second the carnations and other temperate plants, and in the third the roses. I found that watering had much to do with successful growing of plants and that it hurt the plant more to over-water than to leave it a little dry. The weather also had much to do with watering. If the day was cool and cloudy it was best to water but very little, but on a clear, bright day the plants needed much more water. Each plant must be considered separately. Some needed much water, while others needed very little. I found that it was best to water plants in the greenhouse in the early part of the day, so that the sun would have time to dry the leaves before night. If some plants, such as roses, were watered late so that the leaves had no time to dry before night, it was apt to cause mildew. Later in the summer, when the plants were planted out, I found that the best time to water was in the evening; and then during the dry weather they should be well watered and left till they needed watering again. I learned that a little water at a time was not nearly as effective as one good heavy watering. As soon as the soil was dry enough to work after watering we found it a good plan to cultivate the plant well, for this formed a dust blanket and prevented the water from being evaporated as quickly as when the soil was not cultivated.

The first few weeks of my work in the greenhouse consisted of transplanting seedlings from the seedling pots to small pots. Care had to be exercised in handling these seedlings not to injure them, and in planting to plant them deep enough in the pot and yet not too deep. Care must also be shown in selecting the pots of the right size. If too large a pot is used, the soil is apt to hold more water than is good for the plant, and the plant will not do as well. On the other hand, a plant must not become pot bound, as this also injures much. So in this, as in all the care of plants, the individual must be studied and closely watched to learn the condition under which it does best.

The plants which were pricked into pots or boxes during the first part of April were the annuals, which were to be used in the flower beds, and the tomatoes for the garden. After pricking the plants into the pots they were shaded from the sun until they were well

started, when they were put where the temperature and conditions seemed to suit them best. As soon as they were started, the tomatoes were taken to the vegetable house. This vegetable house is started about the first of March and is heated by decaying horse manure, which is about thirty inches deep. On the top is placed six inches of soil, in which the seed of lettuce, radishes, etc., which are to be raised is sown. Other hardy plants and vegetables in pots or boxes are set on the top of this soil. Tomatoes are brought from the greenhouse and put in this house after the weather begins to warm up. The top of the vegetable house is covered with sash, which during the cold nights are covered with shutters, which prevents much heat from escaping.

Besides propagating plants by seed, there are many plants which may be propagated by cuttings. We had in the greenhouse a large number of grape cuttings, made with one bud each. These were put in boxes of sand and required careful attention that they were not over-watered or that the sun did not burn them when they first started to grow. About one week before they were set out, they were taken out doors and put in a cold frame to harden. These frames were covered with shutters at night to prevent the cuttings from being frosted. Many flowering plants are propagated by cuttings. We found that these cuttings did best when placed in moist sand, and must be closely watched not to allow the sun to wilt them, and we must not water them too heavily, for if too much water is applied they rot very quickly, and yet they need sunlight to keep them healthy.

There are several insects that are very troublesome in greenhouses. Those that bothered me most were the mealy bug, scale, lice and red spider. I found that the most satisfactory way to get rid of the scale and mealy bug was to clean each plant by hand and then keep them clean by spraying. The red spider, which is a minute affair on the leaves of plants and makes them appear brown, could be kept in check quite easily by spraying thoroughly. Fumigating with tobacco smoke was a very effective way of getting rid of lice.

Altogether the work has been very instructive to me in many ways, and I have enjoyed it much.

SUNFLOWERS AS BEAN POLES.—The selecting and cutting of poles for the vines of the bean to grow on is no easy task, even where timber is plentiful, and in a prairie country it is a problem. I have found a substitute for the pole in the old-fashioned sunflower, one stalk for each hill. They are ornamental, the seed is good for the poultry and the stalks make fine kindling wood. Some may claim that the sunflower will take the strength of the ground from the beans, but my experience does not agree with this. The finest beans I ever raised were grown with sunflowers for poles.

Calendar for October.

O. M. LORD, MINNESOTA CITY.

The typical days of October are among the most delightful of any season of the year. The later fruits are yet to be gathered and stored, and active preparation is making for the coming winter and for next year.

The new strawberry beds need now special care. In some seasons we have freezing at night with bright sunshiny days, which injures the plants more than steady and severe cold. A light covering of mulch will now be found very beneficial, to be followed with more when the ground has frozen hard. There is usually such a growth and weeds in the old beds that mulching is not so necessary.

As soon as the blackberries have shed their foliage, they are ready to be put down. The sooner this is done after the leaves have fallen the better, as the canes soon become hard and brittle and more difficult to bend without breaking. A round bladed, long handled shovel is the most convenient tool for removing the dirt from the roots. The bushes should be laid lengthwise of the row, and as the dirt is removed from the roots use it to fill the hole of the bush already laid down. Covering the tops with sufficient dirt to hold the bush in place will generally be found sufficient.

In some parts of Iowa, it made little difference last winter whether plants were laid down or left standing, as they were all root-killed. This condition is not likely to occur where we have more snow.

In laying down red raspberries it is not necessary to remove the dirt from the root nor to cover the whole bush. By giving the whole bush a half twist to hold the canes together, a little dirt on the top will hold the canes down. If the whole bush is covered and the spring weather unfavorable, the buds are liable to be rotted. If the tips are injured, they can be cut back.

The Turner rarely needs covering in this vicinity; the Marlborough and Cuthbert are more secure with covering. The Loudon is probably the hardiest of all we have.

Currant cuttings can be taken as soon as the leaves have fallen. The best plan is to cut into eight inch pieces, tie in bundles and place on end in a pit, secure from standing water and covered with soil.

Fall planting of any fruit trees or bushes in Minnesota is not profitable, except blackberries and red raspberries. Apple and plum seeds may be safely planted for nursery stock at any time before the ground freezes.

Mr. Gideon's peaches attracted a good deal of attention at the state fair and received great praise for their size and appearance. There is no difficulty in growing them, but the early varieties are the most desirable, and they must be laid down for the winter. This is not near as much work as is generally supposed, but the precaution to place poisoned grain for the mice underneath the trees must be observed, or the trees will be destroyed. Hay or straw should be placed under and over the trees, as dirt is likely to kill the fruit buds.

Great care should be exercised this month for the preservation of all seeds needed for planting next year, as success depends in a marked degree upon the quality and condition of the seeds.

Secretary's Corner.

THE SOCIETY OF AMERICAN FLORISTS.—This society held its fifteenth annual meeting in Detroit, Aug. 15th to 18th. The following officers for the coming year were elected: president, Edmund M. Wood, Natick, Mass.; vice-president, E. R. Pierson, Tarrytown, N. Y.; secretary, W. J. Stewart, Boston; treasurer, H. B. Beatty, Oil City, Pa. New York city was unanimously selected as the place for the next meeting.

AS OTHERS SEE US.—"Despite the fact that the Minnesota apple crop is almost a failure this year, the showing in horticulture crowded the building, and outside of apples the quality of exhibits was good. The grape display and the showing of native plums was large. A special feature was a display of 97 edible and three poisonous mushrooms made by the Minneapolis Mycological Society, and gathered growing wild in the parks, fields and woods of Ramsey county."—Orange Judd Farmer.

A FORESTRY PRIMER.—The Agricultural Department is soon to issue a primer on forestry, which will interest folks in all parts of the northwest. It is for free distribution. One of the chapters deals with the enemies of the forest, of which fires and reckless lumbering are classed as the worst. In the United States, wind and sheep grazing come next in order. Cattle and horses, it is said, do much less damage to trees than sheep, and snow break is less costly than windfall. Landslides, floods, insects and fungi are also classed as enemies of the forest. The bulletin has forty-seven plates and eighty-three text figures.

WORK WITH SAN JOSE SCALE.—State Entomologist Prof. S. A. Forbes, in Bulletin 56 of the Illinois Experiment Station, details the work of his department in the destruction of the San José scale. There are now thirty localities in the state where the scale has been found. At nine of these the pest has been completely exterminated, fourteen others have been treated, but extermination is not complete, while nothing has been done with the remaining seven infested localities, because of a lack of funds at the command of the entomologist. Forty-three nursery inspections were made at an average cost of $10.43. The year's work demonstrates that the pest is on the increase in Illinois, but that it can be controlled if properly taken in hand.—Orange Judd Farmer.

OUR FRUIT SHOW AS SEEN BY OTHERS.—On another page in this number, Mr. G. J. Kellogg, of Wisconsin, offers some criticisms on the administration and methods of the horticultural department at

the Minnesota State Fair. These criticisms are necessarily made from his standpoint, which is in some measure, at least, a different one from that occupied by the management and exhibitors in mind. There is little criticism of the regulations in force, and we may consider them fairly satisfactory to our critic. The fault to be found with us is that they are not strictly enforced. Our readers, and especially the exhibitors in this department, are asked to give the regulations careful study (they will be found in this number also), and if in their judgment they find they have not been enforced as they should be to assist the management hereafter to do so. It is not always best to require exactly to the letter all that can be demanded. "Justice tempered with mercy," makes the world much more agreeable to stay in. The exhibitors should assist the management in making the enforcement of these regulations sufficiently strict to secure the best general results to all the parties interested.

FRUIT FOR THE PARIS EXPOSITION.—Minnesota has been invited through this society to contribute fruit for the exposition to be held at Paris next year. For good and sufficient reasons, as is believed, the officers of the society have decided not to try to put up a show of Minnesota fruit in Paris, but some of our members may desire to contribute to this object a barrel of Wealthy or of some other variety of apple keeping as well. It is no use to send anything that is not in condition to bear handling several times and come out of storage (which is probably of the "cold" variety), in good condition after June 1st. Mr. H. M. Dunlap, of Savoy, Ill., is government agent in the west for the collection of this fruit, and upon application to him oiled paper and other wrapping paper will be furnished for properly packing any fruit designed for this purpose. The method pursued is to wrap the specimen fruit in oiled paper and then in "fruit" paper before packing. It is likely fruit will keep longer by this method than where less care is taken. Should any of our members decide to contribute to this object, the secretary would like to know of it also, and is ready to give any needed assistance.

INSPECTING THE MINNESOTA FORESTS.—Dr. C. A. Schenck, an officer of the forestry administration of the state of Hesse-Darmstadt, Germany, said to be one of the ablest forestry experts in the world, is in this state in response to the invitation of the State Forestry Board.

Dr. Schenck is on a furlough from his native state of Germany, and has been engaged for some time as superintendent of George W. Vanderbilt's forest at Biltmore, N. C.

Dr. Schenck, Prof. S. B. Green and General Andrews, State Fire Warden, have just returned from a visit of inspection to the pine forests of Minnesota, or as much of them as they could get to in a two weeks' cruise through the big woods in the northern part of the state. The trip was made by request of the State Forestry Board with a view to securing data to be used at the next session of the legislature for a wise revision of the state forestry laws, with regard to the perpetuity of Minnesota's great but fast disappearing pine forests. Dr. Schenck's presence and advice in the matter was

especially desired because of his wellknown ability and familiarity with the subject of scientific forestry, as practiced for more than 100 years in Germany, where practical scientific forestry is all that has saved the forests of that land for the people.

PREMIUM LIST FOR WINTER MEETING.—For the convenience of intending exhibitors at the coming annual meeting of this society, to be held in Minneapolis, December 5-8, 1899, the list of premiums offered on fruit on that occasion is published herewith. A large display is hoped for, and every member attending is requested to save fruit and bring it to help out:

APPLES.

	1st Prem.	2d Prem.	3d Prem.
Collection, not to exceed ten varieties	$6.00	$4.00	$2.00
Each variety of apples (or crabs) included in the 1899 fruit list of this society or in the 1899 premium list of the Minnesota State Fair (kept in cold storage)	.50	.25	
Each variety of apples (or crabs) included in the 1899 fruit list of this society or in the 1899 premium list of the Minnesota State Fair (not kept in cold storage)	.75	.50	
Seedling apple, never having received a premium from this society, not kept in cold storage	3.00	2.00	
Peck of Wealthy apples, the fruit exhibited to be at the disposal of the meeting	3.00	2.00	1.00

GRAPES.

Collection	3.00	2.00	
Each variety exhibited included in the fruit list of this society for 1899 or in the 1899 Minnesota State Fair premium list	.75	.50	

SATISFACTORY WINDOW PLANTS.—No window plants are more desirable for farmers' wives than those which are semi-hardy and tenacious of life. I believe that most would be exceedingly pleased if they would try a dwarf, or Otaheite, orange. One sitting in my window at the present time has not less than 50 blossoms and buds, and at the same time green and ripe fruit. It stands in a pot, about two feet high and two feet in diameter. The flowers give the true orange perfume and are of course delicious. It is likely to be in bloom a good portion of the year. A plant the size that I describe stands in a 7-inch pot. It need never be shifted to one more than 8 or 10 in. in diameter. Give it plenty of charcoal drainage, and when in growth supply it abundantly with water. When at rest it should have very little water. The soil is better with a good admixture of sand and no manure. Take well rotted sod and vegetable garden soil. The oranges will hang on for two years, so that you may have blossoms expanding, green and ripe fruit all on the same tree.

HENS AND PLUMS.—During the curculio season I go out in the plum orchard two or three mornings each week with a little wheat in my pocket and a mallet in my hand. I scatter the wheat along under the plum trees and the fowls follow, and I jar down the curculios with the mallet. Both wheat and curculios quickly disappear.

FRANCIS WILLIAM LOUDON,
Late of Janesville, Wis.
(See biography.)

THE MINNESOTA

HORTICULTURIST.

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In Memoriam.

FRANCIS WILLIAM LOUDON.

Died Oct. 2, 1899. Aged 80 years.

Died at his home in Janesville, Wis., on Oct. 2, 1899, Francis William Loudon, in the eighty-first year of his age. He was born in Orange Co., Vermont, on Dec. 17, 1818. In the spring of 1841 he went to Troy, N. Y., and in 1845 came to Wisconsin and located at Janesville, where he has since resided, and during that time has been engaged in the nursery business and the improvement of fruits by the growing of seedlings.

There are a few men to whose skill and perseverance we are greatly indebted for a number of our best and most popular varieties of fruits, that during their lives were not appreciated and honored as they should have been by the great public who has been blessed by their works. They have sown for others to reap. Some of them, like Ephraim Bull, who gave us the Concord grape, which has revolutionized grape culture in this country and besides comfort and enjoyment has added millions to the wealth of the country, spent long and unselfish lives in prosecuting their noble work and have gone down to their graves unrecognized and unrewarded, but leaving rich legacies to following generations.

Mr. Loudon was a frank, generous, modest and unassuming man, and all his life an earnest and skilful horticulturist. He began the pursuit early, planting seeds of an apple when but two years old, and when twelve years old saw a tree grown from that seed well loaded with fairly good apples. From letters written a month before his decease we find he was still enthusiastically engaged in the loved work of his life. He was the originator of the Janesville grape, the Jessie and many other strawberries and the Loudon raspberry. Besides these he had originated other raspberries of great merit that were not yet introduced, some eight or ten hardy cherries and a number of most excellent grapes. A truly great and good man has gone to his rest and, we believe, to rewards that were withheld while he was with us, and his memory should be forever in the hearts of the people who have been blessed by his life and work.

J. S. HARRIS.

THE MARKETING OF AN APPLE CROP.

L. R. ALDERMAN, HURLEY, S. D.

(Read before South Dakota State Horticultural Society, Yankton, December 14th, 1898.)

The marketing of an apple crop has grown in a few short years from the harvest peddled in grain sacks in a lumber wagon to the car load consignment. Each year has added new phases to the problem. Old obstacles have been overcome, and new ones have presented themselves. This will probably be our portion for years to come. We began by supplying dealers in neighboring towns, and soon found that by carefully sorting the fruit and delivering in good condition we could successfully compete with the foreign product. Our first difficulty was in determining when to pick the apples. If picked too soon they wither, and if allowed to become the least over ripe the harvest apple has a short existence. Even at this time I know no rules to formulate, as every variety ripens differently, and experience is the only teacher. I wish to add in this connection that I discovered that the same varieties mature earlier with us than they do farther south and their season is much shorter.

As our business grew and assumed the commercial phase, we had to acquire all the knowledge of a commission house in packing, shipping and selling fruit, and perhaps our greatest discovery at this time was our increasing expense account. I have, however, learned many things that are gratifying. I have found that I can keep customers year after year, and that South Dakota apples can enter the field of competition and carry off the palm every time. A car of apples shipped to Sioux City this fall received favorable mention in several of the city papers, and they were held at 50 cents a barrel in advance of all stock from Missouri and the east. This has been a red letter year for us, beginning with a large strawberry crop, an immense yield from the cherry trees, and soon after this the marketing of green Duchess in bushel boxes. Our fall crop yielded twenty to twenty-five hundred barrels, and we made three thousand five hundred gallons of cider vinegar.

I shall now give my idea of the most profitable method of marketing a crop of one thousand bushels, or less, a yield which a number of men in this state realized this year. I do not think a crop of this size will return a profit if apple barrels are shipped in, expensive packers hired, and an attempt made to market the apples in a commercial way. Almost as impractical is the method of securing sugar barrels, salt and other odd sized packages, covering with gunny sacking and consigning to Tom, Dick and Harry. If the dealer is unscrupulous, he secures the fruit paying the fright; if honest he will sell the damaged apples for what he can and retain a fair commission. In either case the returns are disappointing. I have seen this fruit all over the state, and it hardly affects the market. I saw eight barrels of Whitney's No. 20 sell for $8 in Mitchell this fall. These were four-bushel sugar barrels covered with sacking. There was a net return of ten cents a bushel to the grower. On the the same day I sold Whitney's at $2.25 a barrel in ventilated apple barrels.

You cannot do a fruit business at long range; you must be on the ground and meet your customers frequently. In 1892 we harvested a crop of 1,500 to 1,800 bushels and hauled it to surrounding towns in wagons. Our profits were more than twice as much as the same number of bushels have ever netted us since. It may seem strange that a crop of that size could be marketed so near home. It was possible by carefully selecting the fruit and giving dealers a better quality than they could get elsewhere and keeping them supplied. Another fact which every fruit grower should know is that a demand for fruit can be cultivated quite as profitably as his orchard. I know of no village in the state that uses the fruit per capita that our own town of Hurley does. I roughly estimate our sales here for this season as follows: two thousand quarts of strawberries, five hundred quarts of cherries, and two hundred barrels of apples. At the risk of appearing egotistical, I will say that this increased demand is due largely to the influence of our fruit farm.

In conclusion, let me add that the fruit industry of South Dakota is not a name but a real tangible fact. The time has come when our fruit must take its place with the butter, beef and other products of our teeming prairies, of which every South Dakotan can be justly proud. Dipping in the future as far as human eye can see, I behold numberless barrels of apples bearing the stamp of the "South Dakota Fruit Grower's Association" going out through all the marts of commerce to supply the needs of a great and expanding west.

HISTORY OF THE PEERLESS APPLE.

GEO. R. MILLER, RICHLAND.

In the year 1864 or 1865, my father procured some apples which were grown in my Uncle George Dorrance's orchard. He saved and planted the seed of these apples, one of which produced the Peerless. The tree soon attracted attention on account of its thrifty appearance, smooth bark and green leaf. Our hopes of the tree were more than fulfilled when it began to bear when it was seven years old. It kept gradually increasing its crop, bearing nearly every year, till in 1886, when it bore eleven bushels of fine, large, red apples. We had twenty-seven props under it that year, and yet some of the limbs broke.

Some gentlemen from Illinois were visiting in the neighborhood, came to see the tree, and they said that they had never seen anything like it.

That same autumn Mr. O. F. Brand began to cut scions to propagate it, and it was sheared so closely that it could not bear much fruit for a number of years.

In the winter of 1887-8, we had a very heavy fall of snow, seven feet on the level by government measurement. It drifted in among our trees very badly, and when it thawed and froze in the early spring it injured the Peerless so that it never fully recovered. It bore five bushels of apples in 1895. During a wind storm in August, 1896, it was blown to pieces, having on a fair crop of fruit.

APPLICATIONS OF FORESTRY METHODS IN NEW YORK TO MINNESOTA CONDITIONS.

PROF. B. E FERNOW, DIRECTOR OF THE NEW YORK COLLEGE OF FORESTRY.

The state of New York may be said to be the first, and until two years ago it was the only state that entered upon a definite forest policy with a substantial basis. This policy dates from the year 1885. The federal government took its first step in 1891, when the president was empowered to set aside forest reservations fom the public domain; Pennsylvania, with a permanent division of forestry in its newly established department of agriculture and with several small forest reservations as a nucleus, entered upon its forest policy in 1896; other states, as New Hampshire, Maine, Wisconsin, Minnesota, Colorado, etc., have their forest commissions either for purposes of inquiry or endowed with educational functions or with the duty to enforce the forest fire laws; but New York is the only state which owns a large state forest reserve, and with a definitely stated policy of increasing the same and a stated policy as to objects and methods of treating the same. Moreover, New York has recognized the educational function of the state by establishing last year (1898) a state college of forestry, where the future managers of the state property are to be educated.

While defective in many respects as to detail, a permanent and stable forest policy is thus inaugurated.

Cornell University has been selected to undertake the experiment, the law providing for a director, two instructors and other assistants, besides the entire staff of teachers and faculty of the university.

A tract of 30,000 acres was set aside in the Adirondacks, on which experiments and demonstrations are to be made, designed to furnish an example to lumbermen and owners of timber lands and to furnish the model for the coming state forest administration.

The college has started, with over thirty students taking advantage of its twelve strictly forestry courses; the demonstration area has been located, and active operations will begin this spring.

The college is also to issue bulletins imparting information to the people of the state, and the first of the series, describing the aims and methods of the new venture, has been issued.

Thus a beginning is made in the United States with professional forestry before the nineteenth century is gone; it is expected that the first graduates will have finished their studies in two years and enter upon life work with the first year of the twentieth century.

The state of Minnesota is in much greater need of a forest policy than the state of New York, for it contains a much larger area of land which is only fit for forest growth and should be continuously devoted to timber crops. While, unquestionably, private interest at a later day will enter upon the business of forestry, at present the financial inducements are not sufficiently alluring, and the state must step in to make the first demonstration. The state can now secure the necessary lands more cheaply than later, either under

the bill advocated by the Minnesota Forestry Association two years ago, or else under a plan such as suggested by me to the forestry commission of Wisconsin.

In this latter plan the cost of acquiring the lands that the state should own is largely charged to the future, obviating present payments. The state takes the lands at their present sale value and pays for them in scrip bearing three per cent interest, on which, however, neither interest nor capital shall accrue until thirty years have elapsed; then yearly payments of ten per cent of the accumulated capital and compounded interest may become obligatory, to be paid yearly until capital and interest is paid up, with the option on the part of the state to cancel the debt at any time before or after the thirty years. By this method the state avoids present expenditure and begins payments when presumably the lands under careful management may be in condition to furnish returns sufficient to meet the payments, while the owners receive a negotiable paper and avoid taxation, turning their unproductive property—such only is contemplated in the purchase—into immediate available cash or a safe investment for their heirs.

This arrangement, which is based upon the idea that the state acquires the property for the benefit of the future, is just to the owners as well as the present and future citizens.

The purchase of the truly forest soils by the state for a forest reserve will also benefit the state in preventing poor deluded settlers wasting their energy and means on lands which are not fit for agricultural pursuits. Above all, keep politics out of the woods as much as possible.

It may be of interest to trace briefly the history of this movement in New York. It centers largely, almost wholly, around the Adirondacks, the mountainous section of the state, which had for many years been a resort for seekers after pleasure and health and of sportsmen, fishermen and hunters.

The lumbermen, more than thirty years ago, had cut and floated out the white pine, which formed a small portion of the mixed forest; then attacked the spruce, which usually forms about twenty per cent of all the growth, and now, with the railroad development, the hardwoods, too, are becoming an object of the lumbermen's exploitation.

As is usual with careless logging operations, with charcoal burners, and still more careless camping parties, fires came in and ravaged large portions of the so-called "wilderness," destroying not only the woods but the thin soil which covers the granite rock. Although the proportion of the area thus laid waste was not as large as one would expect from newspaper statements, nevertheless the unsightly and desolate areas were increasing, and voices became loud as to the state's duty to stop further waste.

A vigorous campaign began about twenty years ago, in which especially the harm to the water supplies resulting from this forest devastation was pointed out. This resulted in the establishment of a commission of inquiry, in 1883, which reported in 1884, recommending action by the state. But the legislation proposed by the commis-

sion found so strong opposition among the lumbermen that it could not be passed.

It was the privilege of the writer to formulate the two bills, which were merged into one and became a law in 1885, the one being the forest fire law, which afterwards served as the basis for the laws of Maine, New Hampshire, Wisconsin and Minnesota, the other providing for a state forest reserve administered by a forestry commission.

It was found that the state then owned some 600,000 acres of land in the Adirondacks, of which it had become possessed through the neglect of the owners to pay taxes, usually lumbermen who had culled the valuable soft woods and had no further interest in the land, it being almost entirely unfit for agriculture.

The commission was to manage this property, with technical advice, under forestry methods. It had power to cut and sell timber and do all that would be required in a forestry management. But the commission failed to employ any technical advice, and the right to cut and sell timber was exercised by merely selling stumpage to lumbermen, who proceeded without change of methods. Only the fire nuisance was greatly reduced. Charges of improper exercise of its powers by the commission resulted in an insertion of a clause into the constitution of the state in 1894 forbidding the cutting of any timber on the lands, thus preventing at the same time the injudicious cutting by lumbermen and the judicious use of the axe by foresters. At the same time, the forest commission was merged into one with the game and fish commission of the state.

In spite of the setback, as we must regard the change, public interest was thoroughly aroused by this time, so that in 1897 an act was passed providing for the additional gradual purchase of lands, to embrace finally an area of two or three million acres, more or less, covering the main part of the Adirondacks. Under this act the state has increased its holdings to over one million acres, spending one and one-half million dollars during the last two years for the additions.

This movement was largely backed by the press and the influential men of New York city, an Adirondack park association having been formed, while the New York State Forestry Association did but little to advance it.

Meanwhile it had become evident that by the mere reservation of the land without a definite policy as to the treatment of the forest cover other than a let-alone policy, the object of the reserve was not fully attained. It was believed that the state should go one step farther and institute an experiment or demonstration of how forestry methods might be safely applied to this property, when at a later date the constitutional bar to the practice of forestry, which means rational timber cutting, might be removed.

Governor Black, taking interest in the proposition, conceived the idea that such an experiment, requiring a long time of continuous, unchanged policy, had best be removed from the ever changing influence of politics and should be entrusted to a strong and stable educational institution.

This thought suggested the desirability of going a step farther: namely, to provide at the same time for the education of professional foresters, the future managers of the state's forest property as well as of other timber properties.

Cornell University was selected to undertake the experiment. A bill was drafted and introduced into the legislature, early in February of last year, was passed and received the governor's signature the end of March, and on April 14, 1898, the first fully equipped professional school of forestry in this country, the New York State College of Forestry, was established; the law providing for a director, two instructors and other assistants, besides the entire staff of teachers and the facilities of the university.

EVERGREENS.

ROY UNDERWOOD, LAKE CITY.

This subject forms itself into two natural divisions respecting the two great uses evergreens may have in the improvement of the farm home: namely, first, their use from an economic standpoint, such as in windbreaks for the orchard, shelter for the stock and protection for the house; and, second, their use in beautifying the surroundings of the home.

On the new homes which are daily being established here, in this great fertile valley of the Mississippi, the first thought of the pioneer naturally turns to preparation for the long, cold winter, which he knows must settle in and render his farm an unproductive piece of waste land during six months of every year. After resolutely facing the chilling winds for a few seasons, he begins to realize the fact that "Nature, unaided, fails," that, even though he breaks the barren sod of the prairie and yearly cloths it with fruitful harvests, still he cannot stop here. Nature frowns upon the man who is content only to sow the crops of grain, which indeed are waving fields of golden life, on which the whole race depends for its existence—yet are those fields yearly planted by the sower but to be as often stricken from the earth by the reaper in the harvest time.

No, the hardy pioneer at once comes face to face with this, nature's great unavoidable edict, "Sow thou that which shall *endure*, if thou wishest me to aid thee toward the goal of happy existence," and he sees that sooner or later he must obey. If he builds himself a house, he discovers that not rafts of shingles nor miles of building paper nor tons of coal can bar winter's icy blasts from the comfort of his hearth. If he stock his barn with animal and fowl, he quickly finds that mountains of corn or stacks of ensilage cannot keep his flocks free from the discouragements and sickness incident to the close *indoors*, or, what is worse, a barbed-wire wind protection on the *outside*. If he seeks to provide his family with the health-laden fruit of the orchard and garden, he again is confronted with the inevitable *drouth* with which the Great Mother perpetually visits the children of earth in her effort to teach them their error in so unblushingly despoiling her forests.

Our pioneer now clearly sees the way. He is no longer undecided, but, in the hope that is, perhaps, the child of despair, he unhesitatingly calls into council the greatly abused tree agent, and the following season finds him with a four or five row windbreak of hardy little evergreens just showing their verdant crowns above the drifted snow on the north and west sides of the home. Luckily he heeds the tree agent's advice to keep the stock fenced out, and for us to prove that nature's frowns have changed to wreathing smiles for this wise and thrifty student of her creation, it requires nothing more than that we pay him a visit after five or six years have added their growth to his fortress of protection and defence, and see for ourselves how the shafts of King Blizzard now harmlessly bury themselves in an unyielding buttress of pine and spruce.

Now, at length, our wise pioneer (and what class of men are more practically philosophical than the farmer?) takes time to stand still for a moment and to draw a full breath. He has industriously trudged up the steep and thorny path of the settler's experience, and has found a broad ledge upon which he can rest for a while. From this point he for almost the first time stops long enough to look over the surroundings. Natural love of the beautiful, which in the race for things more practical and necessary has lain perforce a latent and dormant spark, finds chance to expand in this moment of restful contentment, and, fired by thoughts of the successful attempts already made, he begins to see the inherent beauty in all nature's creations, and resolves to use his awakened sensibilities in the adornment of his earthly habitation.

This is his duty as well as his privilege, and when, perchance, he pays the nursery a visit in search of shrubs and trees with which to beautify the farm home, he does not forget the lesson of the past, but remembers the joy of anticipation he felt in that first year as he looked out and saw the little spots of *evergreen*, bravely defiant of the almost overwhelming sea of snow—and with mind running back to his home where the inner ear catches the subdued purr of the conquered wind among the resinous boughs, he does not forget that the Great Mother, in all her goodness and generosity to men, has given to the brave child of the north hardy creatures like themselves, beings full of strength and beauty, so that, in the winters of adversity, he may not forget that the heart of the world still beats, but always keeps his soul well filled with that *evergreen* contentment that can look with joy through the bleakness of December toward the never-failing springtime soon to return.

LEVEL CULTURE BEST FOR CABBAGE.—Cabbages grown on level land, in Arkansas, produce 40 per cent greater yields than when grown on ridges four inches high and 46 per cent greater than when grown on ridges eight inches high. Level culture was decidedly the best. In the same series of experiments cabbage plants set deep, so that the bud was just level with the surface of the soil, produced much larger yields than if set the same depth as the plants grew in the hotbed.

MUSHROOMS AS FOOD.

(From Bulletin No. 79, United States Department of Agriculture.)

There is a widespread idea that mushrooms and other edible fungi are very nutritious foods. They are commonly said to contain very large quantities of protein (nitrogenous material) and to rank close to meat as sources of this important nutrient. The term "vegetable beefsteak" has been applied to them, and other equally extravagant statements are frequently met with. Numbers of analyses of edible fungi have been reported by the experiment stations. German investigators have also determined their composition and studied their digestibility by human subjects and by methods of artificial digestion.

An extended study of the food value of edible fungi, including their digestibility, has recently been published from the physiological laboratory of the Sheffield Scientific School, of Yale University.

Analysis does not show that edible fungi (mushrooms) possess a high food value, as will be seen by the following table, in which their composition is compared with that of several common articles of food:

Comparison of Composition of Mushrooms and other Foods.

	Water.	Total nitrogen.	Albuminoid nitrogen.	Nonalbuminoid nitrogen.	Protein.	Fat.	Carbohydrates.	Fiber	Ash.
Common mushroom (*Agaricus campestris*)	*Per ct.* 91.30	*Per ct.* 0.60	*Per ct.* 0.36	*Per ct.* 0.24	*Per ct.* 3.75	*Per ct.* 0.20	*Per ct.* 3.50	*Per ct* 0.80	*Per ct* 0.50
Shaggy coprinus (*Coprinus comatus*...	92.19	.45	.15	.30	2.81	.26	*1.40	.57	.98
Inky coprinus (*C. atramentarius*)†	92.31	.36	.....	....	2.25	.24	.....	.72	1.29
Common morel (*Morchella esculenta*. ...	89.54	.49	.37	.12	3.06	.50	*1.60	.91	1.08
Sulphury polyporus (*Polyporus sulphureus*)	70 80	.96	.65	.31	6.00	93	*3.56	.88	2.13
Oyster mushroom (*Pleurotus ostreatus*)..	73.70	.63	39	.33	3.94	.42	*4.84	1.97	1.60
Potatoes.....	75 50	.40	.20	.20	2.50	.10	20.90	.30	1.00
Cabbage.....	92.50	.18	.11	.07	1.13	.50	.70	.....	.70
Carrots	87.50	.18	.08	.10	1.13	.10	.60	‡1.50	.80
Wheat bread...	35.40	1.52	‡1.47	*.06	9.50	1.20	52.80	.....	1.10
Beefsteak (round)...	63.00	3.00	.....	.....	18.75	8.80	.....	.....	1.00

*Dextrose. †Young, small specimens. ‡Approximation.

It will be seen that the mushrooms contain a very high percentage of water. In ordinary food materials protein is the most important nutrient. As regards protein content, the mushrooms rank about the same as potatoes, though they are decidedly inferior in food value, since they contain much less carbohydrates. Nonalbuminoid nitrogen is thought to have little food value. As will be seen, the mushrooms do not contain a high per centage of nitrogen, and a considerable portion of the nitrogen present is in the form of nonalbuminoids.

The value of a food is not determined alone by its composition. The digestibility—that is, the material which the body can retain and utilize—is of even more importance. The experiments at the Sheffield Scientific School showed that from 26 to 59 per cent of the

total dry matter of the edible fungi tested was indigestible. The total amount of digestible protein is the same as in the potato. These results were obtained by the methods of artificial digestion. They agree in all essential points with those obtained by the German investigators. From them the following conclusions were drawn:

When it is remembered that mushrooms contain 75 to 92 per cent of water, and that the total amount of protein present is comparatively small, it will be seen that they correspond with fresh vegetables. Indeed, they are decidedly inferior to many vegetables. The expression "vegetable beefsteak" seems peculiarly inappropriate when applied in a strictly chemical sense. A person depending upon mushrooms to furnish the amount of protein necessary in a day's diet would be compelled to consume about 8 pounds if the morel, a fair average species, were selected. The carbohydrate content of mushrooms is relatively high, but there is no lack of carbohydrate foods in the ordinary diet, and, consequently, no great need for this constituent of the mushrooms.

Although mushrooms and other edible fungi can not be considered as highly nutritious foods, they are undoubtedly useful condiments or food accessories. They add to the palatability of many food materials when cooked with them, and may be served in many appetizing ways. Their use can undoubtedly be extended by skillful growing and careful marketing. The principal edible fungus raised by market gardeners is the common field agaric *(Agaricus campestris)*, and the term mushroom is generally understood to mean this variety.

Although the number of wild edible fungi is comparatively large, there are many poisonous varieties, and too great care cannot be exercised in gathering fungi for food. The poisonous and the more important edible fungi have been described in a recent circular of the Division of Botany,* and in an earlier publication† of this department a number of native mushrooms were described. The growing and marketing of mushrooms has also been described in a recent bulletin of this department‡, and a bibliography of mushrooms has been issued by the department library.§

* U. S. Dept. Agr., Division of Botany, Circular 13.
† U. S. Dept. Agr., Division of Microscopy, Food Products, I.
‡ U. S. Dept. Agr., Farmers' Bul. 53.
§ U. S. Dept. Agr., Library Bul. 20.

CANNED STRAWBERRIES.—Hull and wash the strawberries, put in a colander to drain. To one pound of berries add one pound fine granulated sugar and mash them well together. Set on ice over night. In the morning have ready cans with new rubbers and good covers. Fill in the strawberries, fasten the cover securely, roll each can in paper and keep in a dark, cool place. I have used this recipe for years. The strawberries kept their flavor and color, and there is no roasting over a hot fire. Currants, raspberries and blackberries are equally good this way.—*Selected.*

PLUMS IN LAKE COUNTY, S. D.

A. NORBY, MADISON, S. D.
(Dakota Farmer.)

I planted the first plums here in 1886, De Soto and Forest Garden. The next season the Wolf, Early Red (Russian) and some seedlings were added. Every year since other kinds have been planted in my experimental orchard, so I now have, or have had, on trial thirty-eight named varieties besides a number of seedlings. The plum has been my best paying fruit, the only failure being in 1895, when the small plums which had already formed were destroyed by an exceptionally late frost. The season of 1896 was also, generally speaking, an "off" year for plums in the northwest. A very hard, hot, south wind prevailed during the entire blossoming period, and all varieties, late and early, were forced to bloom at nearly the same time. The result was a large crop of plum pockets, but the curculio and plum gouger scarcely made their appearance, and some varieties, like the Wolf, Wyant, New Ulm and Rockford, matured a good crop. Some of our most productive plums set more fruit than they can mature; this is especially the case with the De Soto and Rockford. Severe thinning will remedy this. Not neglecting this and keeping up thorough shallow cultivation on rich ground insures good sized fruit of good quality.

The web worm (Lyda spoliana) has done more damage to plum trees in this section than any other insect. It is, however, easily controlled by hand picking as soon as the webs appear. Our plums if grafted must be on native plum stock (Prunus Americana). The sand cherry may also be all right as a stock on which to propagate our hardy plums, but the trees grown on myrobolan or peach roots, which are often imported from the south or east, are worthless for this part of the state, at least. I have had some experience in this line. Plums and all our fruit trees should be headed low, so that the tree will better resist hard winds and the branches and foliage shade the body of the tree.

The extra early varieties have more than once escaped damage from hail, which sometimes occurs here the latter part of August. Below I give my experience with the different varieties.

Seedling No. 1.—Originated from seed of the Iowa, hardy, vigorous, spreading grower, moderately productive. Fruit about one inch in diameter, round, red, quality fair; ripe from the fifth to the middle of August, the earliest plum yet fruited here.

Iowa.—Brought from Allamakee county, Iowa; yellowish red, oblong, size large, not a reliable bearer, ripens about five days later than Seedling No. 1.

Odegaard.—Originated in Brookings county from pits sent from Minnesota. A remarkable variation in tree and fruit from the common type of Prunus Americana to which it belongs. Tree hardy, a vigorous, spreading grower; buds and foliage very large. Fruit, oblong, large to very large. The best specimens measured this last season one and three-eighths by one and five-eighths inches through. Color, dark red when fully ripe; quality, very good for cooking or canning, being nearly free from the acid taste so objectionable in

most of our hardy plums. When well ripe the skin peels off readily. It ripens very early, about with the Iowa. Fruited for the first time here, and is a very promising variety.

Marble.—From Brown county, Minn. Tree good and very productive, always setting a full crop. Fruit, round, mottled red; quality good. Ripens about the first of September. This variety is sometimes subject to rot, and is of rather small size for the market.

Knudson's Peach.—From same place as the Marble. Tree good in all respects. Fruit hardly of medium size, sweet and good, but drops before well colored, and is too small for market, also much subject to plum pocket fungus.

Homestead.—Also from the same source. Tree hardy, and a great annual bearer of purplish red fruit. Ripens with the Forest Garden; too small for market.

New Ulm.—Tree very hardy, but of a crooked, irregular habit; wonderfully productive, quite free from plum pockets. The fruit hangs well to the tree till colored and ripe; size, large to very large. often one and one half inches in diameter; oblong. Color, light red covered with a beautiful pinkish bloom; very attractive and brings highest price. Pit small for size of fruit; quality good for any use, First ripe about September 1st, lasting for three weeks. Sometimes attacked by rot, yet one of the most profitable to grow.

Caroline.—One of Heideman's seedlings. Hardy and of good quality, but much subject to pockets and not sufficiently productive.

Cheney.—Differs much in tree, blossoms and fruit from the common type. Tree upright and perfectly hardy; early and abundant bearer; fruit large to very large, and equal in quality to any native plum I know of for cooking and canning. Its chief faults are its inclination to produce pockets, and the fruit is more easily blown off by heavy winds than many other kinds. Still I regard it as one of my best medium early plums. It always brings the top price in the market.

Rockford.—This is very hardy, very early and a prolific bearer; generally needs thinning. Nearly free from plum pocket fungus, but scabs more or less, though it shows little when ripe. It is of dark red color with fine blue bloom; pit rather large; quality very good for dessert; of only medium size, but one of the best in my collection.

Forest Garden.—Tree a fast grower, often kills back when young, and liable to split down; productive and of good size, sweet and juicy, but inclined to produce pockets. I think now we have better varieties.

Old Gold.—One of Heideman's seedlings. Foliage punctured by rust spots; of fine golden yellow color, of only medium size and not equal to many others.

Harrison's Peach.—From scions received from C. W. H. Heideman, New Ulm. This has proved here the poorest of all the named varieties of hardy plums. It has never borne even a fair crop.

Wolf.—One of the best in the whole list; an abundant and annual bearer; fruit runs larger than De Soto; very free from plum pockets,

and colors up well before getting soft, making it a marketable variety of value; ripens the first week in September. Not a freestone, as generally described.

Wyant.—Also a tree of good habit and hardy. An early, great and sure bearer, not bothered with pockets; size, large, oblong flattened; dark purplish red; pit small and nearly free; quality fine when eaten out of hand, but has a more or less bitter taste when cooked. Fruit hangs well to the tree till ripe; valuable.

Ocheeda.—Tree perfectly hardy, with thick leaves; fruit medium size, yellowish red, beautiful translucent when well grown; quality excellent; clingstone.

De Soto.—Hardy, of slow growth and upright habit. Excessively productive, nearly always setting more fruit than it can properly mature, and if not severely thinned will run below medium size in dry seasons. In quality it is one of the very best of our native plums, quite free from pockets, but often hurt by the curculio.

Hawkeye—Fairly hardy, productive, of large size and cracks badly after rains. A little earlier than De Soto.

Baldwin.—Bore a few samples last season, but have not formed an opinion of it yet.

Dr. Dennis.—Hardy and a good grower, has borne two crops; hardly equal to Wolf or Wyant.

City.—A late freestone plum from Brown county, Minn. Hardy and productive; lacks attractive color.

Blackhawk.—Tree satisfactory; fruit large and rough looking; pit very large; skin thick and tough. Will not sell well with better looking kinds.

Comfort.—Tree stands well and is productive, but rather late in some seasons. Not equal to the Wolf.

Van Deman.—Hardy and late; fruit good size.

Champion.—Tree good and productive, but ripens too late in most seasons to be of value here.

Early Red (Russian).—Planted about ten years ago, now nearly dead; has not been profitable. Fruit fine when you can get it.

White Nicholas and Long Blue are not any more promising.

Surprise, Aitkin, Early Minnesota, Manitoba and American Eagle have not yet fruited here; but I expect these to rank with the very best.

CONTROLLING THE CUTWORM.—According to Prof. Johnson of Maine experiment station, the cutworm may be controlled by the use of poisonous bait made by mixing 50 pounds of wheat bran with two quarts of molasses and one pound of paris green with water enough to make a thick mash and distributing it among the plants attacked.

EFFECT OF INSECTICIDES ON SEEDS.—It is often desirable to soak seeds in some solution to prevent their destruction by such pests as gophers and the like. The Kansas experiment station finds that this soaking is in no way detrimental to the germinating qualities of the seeds. On the contrary there was an increase in the percentage which germinated.

MY EXPERIENCE IN APPLE GROWING.

J. C. WALKER, ROSE CREEK.

My experience in apple growing dates back to the early sixty's in Caledonia, Houston County, Minn., where I planted my first apple trees. At that time there were no agricultural societies in Minnesota or Wisconsin (agriculture, of course, includes horticulture and apple growing). At that time the future seemed dark for apple growing. In 1862 dawned a new era for these industries by an act of United States Congress, known as the Morrill bill, granting to each state in the Union government lands for founding an agricultural and mechanical college. It was signed by Abraham Lincoln in July, 1862. Minnesota secured 200,000 acres, more or less, of land, and Wisconsin 240,000, to aid in preparing useful knowledge of agriculture and the mechanical science.

We should not overlook the noble work our experiment stations are doing to make apple growing a success in our state. To aid in this noble work another act was passed by the United States Congress known as the Hatch act. By this act the general government, in 1887, appropriated $15,000 annually to each state in the Union for the maintainance of an experiment station, and I may say that these liberal acts of congress have produced good results, as is seen here today by our coming together to give and to receive instruction in fruit growing. Apple growing in Minnesota is no longer an experiment, the way is open to success to every tiller of the soil who will accept the gospel of horticulture as taught by our state horticulturist.

My second planting of apple trees was in Canton, Minn., in the early seventy's. I sold out before the trees came into bearing.

In 1875 I moved to Rose Creek, Minn., and planted apple trees there. The varieties, Duchess, Tetofsky, Wealthy and Ben Davis, I bought direct from the nursery, together with Hyslop and Transcendants. The last two named have been dead ten or twelve years, while the former are doing well, having been planted twenty-three years, and have borne many fine crops.

In 1884 I planted other varieties, the Haas, Plumb Cider, Whitney No. 20 and Pewaukee. This last variety are all dead, having borne only one crop of fruit. I have some Hibernal and Longfield trees planted two seasons that are well set for fruit the coming season. On account of frost the last of May and first of June, 1897, my apple crop was very light.

My mode of planting is to set deep in the ground, six or eight inches deeper than in nursery rows; rows eighteen to twenty feet apart, and twelve to sixteen feet apart in the row; the trees set angling to the southwest, with a prospective limb on south side of the tree to shade its own body from sunscald.

Apple trees to be cared for by the owner must be fenced in, and all stock must be kept out of the orchard. I have never had an apple tree injured by mice. I adopted a plan that has been successful. Each fall I build a mound one foot high around the body of the tree, and late in winter or in early spring when mice are running

under the snow upon coming to this mound they are turned aside, and the apple tree is saved.

Apple trees must also be fed by stable manure for mulching, but in no case should it be piled close to the body of the tree, but spread out. The man who tethers his cow out in one place all the time and expects plenty of milk will be disappointed; just so the man that plants apple trees for all time will be if he fails to co-operate with nature. Our father Adam was an apple grower of the highest type, but by disobeying orders he was driven out of the garden, and since then his children have been out too.

PLANT HOME GROWN APPLE TREES.

F. W. KIMBALL, AUSTIN.

I am asked to tell the advantages of planting home grown trees in the apple orchard. While I may not be able to state many reasons, one is enough to cause me to buy home grown instead of outside stock. When you buy home grown, and the trees fail to do well or fail to prove true to name, as do many of the foreign grown trees, then you know where and with whom to register your "kick."

I do not think the ordinary planter can afford to buy except of home grown stock. I think our nurserymen cannot afford to and do not chance growing a lot of stock that is not reasonably safe to grow in this climate. If they are in that business, it is to make a living, and a living reputation, and to that end they cannot afford to deceive any farther than they have allowed themselves to be deceived. Again, they are all in touch with the fruit interests of this section and can better advise the planter what to plant, and as very few are well enough read on this subject to know what to try, it is of great advantage to have such advice. They can also better advise as to soil, location, etc., for an orchard; and as most buying stock wish it to grow (though should you see them take them and bundle them into their wagons and not even cover their roots from the hot sun, you might think them indifferent even to that), they can best assure themselves of a living chance by buying home grown stock that comes to them, the limbs bright, the roots in perfect condition and bound to grow with half a show, instead of the stock I have seen distributed from this town, brought in big boxes and stood around for days, the limbs shrivelled, the roots dried up and the whole appearance of that sickly order that causes you to wonder if that stock can grow at all. And it is a well known fact that much of it is not true to the name it is sold under. So, as I first said, buy where you can make your "kick" in case you need to.

TOMATO ROT.—This disease is caused by a fungus which is disseminated from plant to plant by winds, insects and other agencies. The best remedy against this pest is spraying with bordeaux mixture. The fungus spreads most rapidly during warm, moist seasons. It is therefore best to commence spraying before the plants are affected even, and repeat the operation every week or two.

THE STRAWBERRY.

R. HOAGLAND, MINNESOTA SCHOOL OF AGRICULTURE.

The strawberry is the most popular of all our small fruits. It is found, either in a wild or cultivated state, in all the states of the Union.

Although Minnesota is the North Star State, yet she is quite a large grower of strawberries. With the right kind of care, they may be grown in nearly every county in the state, and with profit to the grower.

The strawberry is propagated by means of seeds, runners and plant divisions. All growers for market propagate by runners. Plants do not come true from seed, and probably not one seedling in ten thousand will be as good as any one of the standard varieties we now have. The seedlings are grown by crushing some of the dead ripe berries in some sand, and by sowing sand and berries in a rich and somewhat shaded seed bed. The plants will be up in a few weeks, and when large enough to handle should be transplanted, four inches apart, in another seed bed, and left there that season. The next spring they may be set out in the field, and on the following, or third, year they will bear fruit.

Growing strawberries from seed is not generally a profitable business, and is only followed by horticulturists who wish to originate a new variety which will prove better than any one of the varieties we now have.

For practical purposes, strawberries are grown from runners. These are produced in abundance on rich soil by most of our best varieties. The connection between the young and old plant dies out the first year. The young plants are the ones to set out. Never set out plants that have borne fruit. You can tell a young plant by its white roots. The roots of the old plant are hard and black.

Sometimes plants are grown from plant divisions, but this is done only when we wish to preserve some choice variety. In such a case, the old plant is divided into several parts, and these are set out in the same manner as young plants.

The best location for a strawberry bed is on a north slope. There are several reasons why this is the best location. First—There is less freezing and thawing during the winter and spring. This thawing in the daytime and freezing at night is what injures the roots of the plants more than any other cause. Second—The snow stays on later in the spring. This prevents the bed from starting too early, and so the plants do not blossom until danger from frost is over. Third—The bed is not subject to the hot, dry winds of summer.

Any soil that will produce a good crop of corn will grow strawberries. The land to be used for a strawberry bed should be plowed in the fall, and a good coat of manure should be plowed under in the spring. The land should then be thoroughly harrowed, so as to be in a fine condition for planting.

The best time for planting is in the spring, although plants are sometimes set out in the fall. All large growers set out in the

spring, preferably before the middle of May. If the ground is very dry when planting time comes, it is better to wait a few weeks for rain than to set out in dry soil and try to keep the plants alive by watering.

There are two methods of planting, the hill system for the home garden, and the matted row system for large growers. In the hill system we set the plants out one foot apart, in rows four feet apart. The runners are kept cut off, so that we have one large plant to each hill. This system will produce fine, large berries, but not so abundantly as by the matted row system.

In the matted row system we set the plants out two feet apart, in rows four feet apart. The land may be marked out with a corn marker, so that the rows will be four feet apart one way and two feet apart the other way, and the plants set at the intersections. After the plants are set out, the cultivator should be run both ways, until the runners start, when it should be run only in the four foot interval. The cultivator will push the runners together so as to form a matted row about eighteen inches wide. The plants should be six inches apart; if nearer, thin out with a hoe. The bed should be cultivated at least once every ten days until the end of August, when cultivation should cease for the season.

The young plants which we set out should have the tops trimmed so as to leave only two or three of the most thrifty leaves, and if there is a thick mat of roots they should be trimmed back to about three inches.

There are many ways of setting out plants, but probably the most common is the man, spade and boy system. After the land is marked out the man places the spade with the back side away from him, presses it about six inches into the moist earth, moves it from him and lifts it out. The boy takes up a plant, separates the roots and puts them in the hole. The man puts the spade in the ground about four inches nearer him than he had it before, and presses the soil against the plant. The boy finishes the operation by firming the plant in the soil with his hands.

In this vicinity, in order to secure the best results, the vines must be protected in the winter. A deep coat of snow will answer the purpose, but as we cannot depend upon having that it is necessary to cover with litter of some sort. Straw, marsh hay or cornstalks will answer the purpose. This litter should be free of weed seeds. The litter should be put on the bed after the ground is frozen hard enough to bear a team. About three to four inches of litter is enough in this vicinity, but in exposed locations much more is needed. The covering should be taken off in the spring, about the time the leaves start, and it may be placed between the rows to serve as mulch during the summer.

If there is any danger of frost after the plants are in bloom, some of the litter between the rows may be thrown over the plants at night and taken off in the morning. This will protect the blossoms so that they will not be injured by the frost.

Most growers prefer to fruit the bed only one season, while others fruit their beds two seasons with good results. If you desire to

fruit a bed the second season, it may be renewed in the following way. Plow along each side of the row so as to leave a matted row eighteen inches wide. If the plants are closer together than six inches, they should be thinned out with a hoe. The furrows along each side of the row should be filled with well rotted manure, and the cultivator should then be run between the rows so as to cover up the manure. The bed should be kept cultivated for the remainder of that season.

It is well to be remembereed in setting out strawberry plants that some varieties have perfect flowers, while others have pistillate flowers. In setting out a bed, at least every third row should be a variety with perfect flowers, so that the pollen from the flowers of the perfect variety may fertilize the flowers of the pistillate variety. It is better, however, for a beginner to plant a variety with perfect flowers, as the Bederwood.

Most of the varieties now offered for sale by nurserymen may be had for about one dollar per hundred. There are a great many varieties offered for sale, but only a few are considered standard varieties. Among these are Warfield, Haverland and Crescent, pistillate varieties, and Bederwood and Wilson, perfect varieties.

ARE ANTS INJURING TREES.—Complaints concerning the injury done fruit trees by ants are very common, yet in about 99 cases out of 100 the ants are not doing the injury but merely accompany other insects which do more or less harm. Almost always when ants are found on a tree, a careful inspection will show that it is infested with some kind of plant louse, psylla, or scale insect. All of these insects excrete a sweet, sticky fluid, known as honey dew, which forms a large item of food with the ants. In fact, the ants actually raise the young plant lice and care for them, almost the same as we do cattle, so that later on they may secure the honey dew from them. This they secure by gently stroking the plant lice with their antennae, when they readily give up small drops of the coveted liquid.

In the case of many plant lice which live both on the roots and leaves of trees, the ants often may be found carrying the lice up onto the trunk, if observed early in the season, which I have noticed with the black peach aphis. Recently I met a man from Vermont who was complaining of ants injuring his pine trees. No doubt the pine trees were affected with a scale, which occurs very commonly on them, known as the pine kermes. This, like many of the larger scales, gives off a similar secretion while it is still young and before the scale becomes hardened, and is attended by ants for this reason. Very often these obscure scales, though doing the tree considerable injury, remain unnoticed, and the damage is laid to the account of the ants' nests when they can be found, thus preventing them from aiding the plant lice and scales. The plant lice and scales may be destroyed by spraying with kerosene emulsion or whale oil soap.

A. D. S.

NATIVE EVERGREENS OF MINNESOTA.

D. A. GAUMNITZ, MINN. SCHOOL OF AGRICULTURE.

Not long ago, as I was making a trip over a section of this state by rail I observed, as I sat by the window, that a great many houses appeared to have no life about them. Doors of buildings were off their hinges, fences down, everything appeared to be in a shiftless, lifeless condition, while others, although they were not of the best buildings, appeared to be neat and tidy. There were groves around them which seemed to speak. You could feel a thrill of pleasure, a longing to get nearer; your feelings towards one another were kinder; you would forget for a time all about the hard times, the struggle for wealth and honor, and give yourself to the enjoyment of nature.

The thought came to me, what is it that makes this great difference? It is the cheerful and ennobling influence that the trees have on the families. Then why cannot all of us enjoy this pleasure of life? There are trees suited for all conditions. Let us look over the state and see what we can find for our purpose in the native evergreens.

The red cedar is one of the most widely distributed evergreens we have. We find it growing in dry soils and also in swamps. It is hardy and durable, growing in nearly every locality. This makes it very desirable for planting around homes, as it is a very valuable ornamental tree for this section. It is a rather slow grower except when young, and makes the best kind of low windbreak or hedge. It stands pruning well and, therefore, can be made to be of much benefit for ornamental purposes as well as for windbreaks. The timber is valuable, as it is more durable in contact with the soil than any other native evergreen. It is used for cabinet work, in the manufacture of tubs and pails, and is almost the only kind of wood used in making lead pencils; but in this section it does not attain sufficient size to be useful for most of these timber purposes.

The jack pine is hardy, growing in poor, sandy soils and lands that have been burned over severely. In this state it covers large tracts of such lands. It is sometimes called the fire pine, because the cones generally remain closed until a fire sweeps over and causes them to open and let their seed out.

The jack pine is not a pretty tree and is seldom used for ornamental purposes; nor does it often get large enough to be used for timber, but it is one of the hardiest evergreens we have, adapted to growing on dry, loose, sandy soils, and having the power to withstand drought well. The jack pine is of very rapid growth when young. This, with its hardiness, adapts it to the dry, sandy soils of the northwest. It is often used as a nurse tree for Norway and white pine, which soon outgrow it.

The Norway pine is found in the northeastern part of the state, and like the jack pine, grows in sandy soils and is comparatively hardy. Within or near its range, it makes an excellent tree for ornament or windbreak. It has a robust, sturdy appearance and would undoubtedly be planted more if the seedlings could be obtained cheaper. The reason for this is that the squirrels are so fond of the

seeds that they sometimes eat them before they are matured and take nearly all the crop. The lumber from this tree is used principally for framing, flooring, wainscoting, car sills and ship building.

The white pine is the most important of our native pines, although it is not as hardy as the others spoken of. It is one of the fastest growing and, perhaps, the most graceful evergreen for ornamental purposes. We find this evergreen growing in a clayey soil, but it also grows rapidly on any retentive land. On poor soils the jack and Norway pines soon crowd it out. This pine has nearly the same distribution in good land in Minnesota as the Norway, although it extends rather further south. When planted in exposed localities the young trees should be somewhat sheltered, as they are liable to be killed by the dry winds of early spring.

It is a large, magnificent tree, and its round, pendulous cones (four to six inches long) mingled with its long, green leaves give a fine appearance. Of all the native trees, the white pine is the most important and valuable and yields the best lumber. The lumber does not swell or shrink much, is soft, light, straight grained, easily worked, of good color and is especially valuable for sash, doors, blinds, shingles and for general building purposes.

The white spruce is a good evergreen for ornamental purposes. It reaches its best development in the northeastern part of the state, in moist soils, and is very common near the international boundary. It is a very pretty tree with dark green foliage (which is one-half to one inch long), growing up rather slowly but in a graceful, pyramidal habit, with horizontal branches, and occasionally reaching the height of 100 feet. The wood is much used for flooring, paper pulp and sounding boards for musical instruments. The tree is very beautiful but not so hardy as some.

The home of the black spruce is in the swamps in the northern part of the state. It is a poor ornamental tree, as its lower branches soon die and with the dead, persistent cones in them make an unsightly appearance. It is a short lived tree on dry land in this section, and while it sometimes attains sufficient size to be used for lumber yet it is destined to be used most extensively for paper pulp.

The white cedar, or arbor vitæ, is found growing in cold swamps and along river banks and lake shores in moist soils. It is common in the northeastern portion of the state but is scattered south as far as the southeastern portion of Winona county. It is not found in the western or southwestern part of the state. The arbor vitæ is a very popular coniferae for forming evergreen hedges, as it takes such a close, compact form when pruned. Its light, green color and peculiar habit of the branches and flattened twigs gives it a very handsome appearance.

It stands well in this section if in a well protected location and in good, retentive soil, but suffers if not well supplied with moisture. The wood is used for telegraph poles, fence posts, paving blocks and shingles. This tree grows from fifty to sixty feet high and when planted close together and kept trimmed closely, forms beautiful hedges as well as windbreaks.

The common juniper is closely related to the red cedar but is a dwarf in habit, spreading out and forming mats on the ground four feet or more in height. It is generally found along bluffs of rivers. Its great hardiness and pretty dwarf habit makes it a favorite for ornamental purposes. There are a great many varieties distinguished by their form and habit of branching.

The balsam fir is found in the northern half of the state in swamps and cold, damp woods. It grows on moist, retentive soils, holding on well in this section, but is poorly adapted and should not be used for general planting, although it is very pretty when young and grows with a slender, symmetrical top. As a timber tree it is of no value, but might possibly be of use in crowding white pine into timber form.

The hemlock is scarcely found in Minnesota, overrunning only near Cloquet, in Carleton Co. In Wisconsin it covers large areas and yields large quantities of bark for the tanneries. It can be grown in this section in sheltered localities.

For windbreaks we may have a great many trees suited for the purpose, but if not properly arranged they will not give the desired results. The first object to have in mind is the subject of protecting our buildings, their occupants and stock around the barns. In planting these trees be sure to plant them far enough away from the buildings to prevent the snow from drifting against them.

It is not desirable to compose our windbreaks of one variety of trees, but rather of mixed varieties. One drawback to plantings made up of entirely one variety is that drouth, insects or fungous diseases might destroy the whole planting at one time, while in a judiciously mixed planting this could hardly occur. We should not make the mistake that has often been made in planting European trees which are not adapted to our climate. Evergreens possess the quality of being more effectual as a windbreak and are also more ornamental in winter than the deciduous trees, which at that season have a dreary, pole-like appearance.

The fact that some trees require more shade than others would admit of growing one variety under another, making the planting dense, and protecting some of the less hardy kinds, giving variety, which would produce more beauty.

The species that have thin foliage demand light, while those with thick foliage generally endure considerable shade. The Norway pine belongs to the former class, while the white pine, white cedar, balsam fir and spruces belong to the latter.

When trees are desired in the lawn for ornament, it is well to plant those which will not be of too much obstruction to the view, selecting with reference to ornament. One should guard against having many trees directly in front of the house, as is often the case.

EFFECT UPON THE HOME.

Our forefathers selected their homes in the eastern forests and were obliged to use every means to destroy the forests, for the purpose of clearing their farms. As immigration drifted westward, upon the great plains, the dreariness of the homes caused them to reflect. The intense rays of the sun in summer and the cold blasts of winter

brought to their minds the comforts and cheerfulness of the evergreens around their native homes.

The upbuilding of the finer and ennobling qualities and their influence upon the character will be of a more marked degree where there are trees surrounding the home.

The parents will go down their declining years looking back over their lives with a greater degree of enjoyment and satisfaction.

Young people growing up under these surroundings will look back to the homes of their childhood with a greater degree of all that makes the remembrance of home dear to them, and looking out over the great world, they will see more that tends to make life worth living and have a stronger sympathy for humanity.

PLAN FOR REFORESTATION OF WASTE LANDS IN MINNESOTA.

DR. C. A. SCHENCK, BILTMORE, N. C.

(From Annual Report, 1898, Minnesota State Fire Warden.)

Gen. C. C. Andrews, Chief Fire Warden, St. Paul, Minn.

DEAR SIR:—Pursuant to your request,I beg to submit to you statement of the possibilities of planting up large areas of otherwise abandoned and barren land in the state of Minnesota. I have assumed that an area of two million acres is to be planted up in the course of the next eighty years, and that waste land may be acquired for an amount corresponding to the arears of taxes thereon due to counties and towns.

EXPECTED EXPENSE OF AFFORESTATION PER ACRE.

Strong white pine seedlings two years old, nursery grown, as will be well adapted for the reforestation in question, can be raised at a price not to exceed $1.25 per thousand. If raised on a large scale it is not impossible that the price will be reduced to one-half of the figure given.

Cleft planting—which means planting in small holes made with a narrow and long spade—should cost not more than $1.00 per thousand for white pine seedlings two years old.

Five thousand plants per acre will be ample and will allow of a considerable death rate in early youth, as is sure to occur, and at the same time will allow the selection of the fittest individuals to take place from a large number of plants.

Assuming that the figures above given are correct, the reforestation will cost $11.25 per acre, to which must be added the price of the land, estimated to be 25 cents per acre, making a total of $11.50 per acre.

Figuring at 2 per cent compound interest and discounting $11.50 for eighty years, the figure $55.20 is reached as representing the cost of the original plantation, with compound interest on it accumulated, at the age of eighty years.

In the meantime, taxes on the land, the cost of protection and administration, which will certainly not amount to more than 5 cents

per acre per year, if planting is done on a large scale, will add up, again with compound interest of 2 per cent, to the figure $9.70. Adding $9.70 to the figure of $55.20 just given as representing the final cost of the planting per acre, we reach the figure $64.90.

If the yield per acre after the lapse of eighty years is as much as $64.90, the planting will have paid 2 per cent of compound interest.

EXPECTED YIELD PER ACRE.

The white pine tables published by Messrs. Pinchot and Graves, in 1896, show that a plantation of white pine eighty years old is likely to yield the following amounts of lumber, if the trees are used up to a diameter of the logs not less than 8 inches:

On first quality of soil.....24,200 feet B. M. per acre.
On average quality of soil.....12,000 feet B. M. per acre.
On third quality of soil.....3,700 feet B. M. per acre.

Assuming that the two million acres to be planted up have a soil corresponding with Pinchot's and Graves' average quality, which I think is a safe supposition, and further assuming that the stumpage of white pine land thus raised is worth $5.50 per thousand feet B. M., the expected yield is worth $66 per acre.

I am confident that this price of stumpage and the amount of lumber per acre given are perfectly obtainable, to say the least. In other words, the expected yield per acre will be such as to certainly pay 2 per cent of compound interest on the original cost of planting, taxes, protection and administration, which should not be more than $64.90 per acre, as shown above.

VALUE OF THE ENTIRE INVESTMENT AFTER EIGHTY YEARS.

If a plantation eighty years old is worth $66.00 per acre, then a plantation—

70 years old is worth, discounting it at 2 per cent.....$54.12
60 years old is worth, discounting it at 2 per cent..... 44.22
50 years old is worth, discounting it at 2 per cent..... 36.30
40 years old is worth, discounting it at 2 per cent..... 29.70
30 years old is worth, discounting it at 2 per cent..... 24.42
20 years old is worth, discounting it at 2 per cent..... 20.13
10 years old is worth, discounting it at 2 per cent..... 16.50

If we plant for eighty years in every decade of years 250,000 acres, we shall have at the end of that period an area of two million acres covered with forest growth of different age classes—in fact, an ideal arrangement of age classes, allowing the forest to cut 25,000 acres of mature timber annually thereafter.

The forest will consist of the following areas:

250,000 acres worth about $66.00 per acre, making a total of 16.5 million dollars.

250,000 acres worth about $54.00 per acre, making a total of 13.5 million dollars.

250,000 acres worth about $44.00 per acre, making a total of 11.0 million dollars.

250,000 acres worth about $36.00 per acre, making a total of 9.0 million dollars.

250,000 acres worth about $30.00 per acre, making a total of 7.5 million dollars.

250,000 acres worth about $24.00 per acre, making a total of 6.0 million dollars.

250,000 acres worth about $20.00 per acre, making a total of 5 0 million dollars.

250,000 acres worth about $16.00 per acre, making a total of 4.0 million dollars.

The entire area of two million acres will bear an aggregate value of stumpage amounting to 72⅛ million dollars.

AGGREGATE ANNUAL OUTLAY.

The expense of two million acres of land at 25 cents per acre will be $500,000.

Annual expense for planting 25,000 acres at $11.25 will be $281,250.

Besides for taxes, protection and administration on an average area of one million acres—assuming that the two million acres will be acquired gradually—these expenses to be 5 cents per acre, must be spent annually $50,000.

Thus, at an annual expense of say $350,000 per year the state will own forest property worth 72½ million dollars after the lapse of eighty years.

RETURNS AFTER EIGHTY YEARS.

From the eightieth year on the forest will yield annually, on 25,000 acres, 12,000 feet B. M. per acre or 300,000,000 feet B. M. on the whole, worth at least $1,650,000, figuring at a stumpage value of $5.50.

It is very likely that a considerable yield from thinnings will be obtained at the same time. Under proper care, a second growth will be secured, in the place of the one planted, free of charge, from self-sown seed.

If the increase of lumber prices holds pace with the increase of population (1½ per cent per annum) the result will be 3.3 times better than shown above. The investment will then yield 3⅓ per cent of annual interest instead of 2 per cent.

It is worth mentioning perhaps that the exclusive right of fishing and hunting on say 25,000-acre sections of the forest leased out periodically under certain restrictions will yield a considerable return as well.

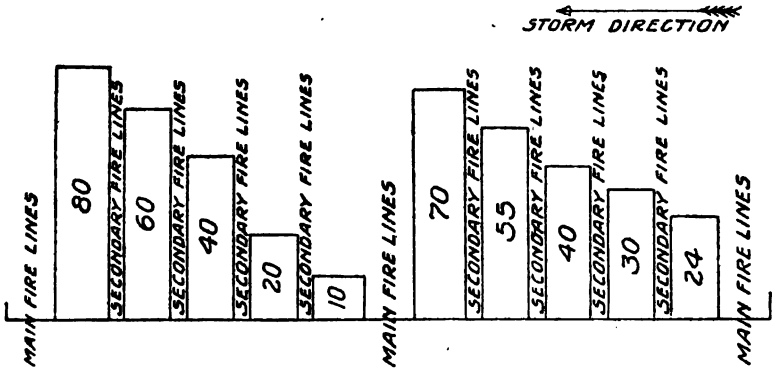
To protect fish and game whilst protecting the forest will be an additional duty of the staff of forest rangers. The combination of forest rangers and game keepers is even from a financial standpoint a most desirable one.

SOME HINTS FOR PLANTERS.

The planting, to begin with, should be made in a way safe-guarding the future forest against damage from fire, storms and insects. As large, even aged, forests suffer from these factors in a high degree, the reforestation should be made in strips, say 500 feet wide.

The best soil should be planted up first so as to obtain early returns and so as to secure the necessary training of the crew of planters and of the superintendent of the rangers before more difficult tasks are begun on poorer soil.

The planting should proceed gradually toward the prevailing storm direction, so that after eighty years the plantation would lie about as follows:



The figures given in this sketch represent the age of the strip of forest. Every two series of such strips are separated by what may be fire lanes.

Under this arrangement the storm will not blow down any trees.

Between every two strips, lines about 16 feet wide should be left unplanted as secondary fire lines. They should be kept cleared from inflammable matter as much as possible, so as to act as secondary fire lines and so as to facilitate supervision and transportation of forest produce. The main fire lines, separating two series of forest plantations should be about 100 feet wide. They should be established at intervals of about 2,500 feet and should be kept absolutely clean from any inflammable matter, being burned over annually under proper supervision by the forest rangers.

This arrangment will necessitate each series of plantations to have a width of about 2,500 feet, or to consist of about five stripes each.

Adjoining strips should differ in age by at least five years and by not over twenty years, so as to avoid the spread of insect pests and fungous disease on one side and heavy overshadowing on the other side.

Seedlings and saplings of pine, tamarack, white cedar and hard woods, wherever they appear in groups sprung up from self-sown seed, should be fostered, whilst single indiviuals—especially misshapped and shrubby trees—should be gradually removed by deadening or otherwise.

A good survey must precede the entire operations. Without the help of accurate maps, forestry work is uncontrollable.

Only compact bodies of land should be acquired, the cost of protection and administration per acre being much smaller in this case.

HOW TO OBTAIN THE NECESSARY FUNDS.

The state will be entirely justified in securing the moneys necessary for the acquisition and the reforestation of land by public loans. Even part of the interest (certainly 2 per cent) due on such loans may be secured by loans. The increase of the loans, to be made annually, will go hand in hand with the growth and the extension of the forests.

The loans, backed by valuable assets, viz., the forests, will be obtainable at a comparatively low rate of interest. From the eightieth year on the net revenue from the forest is likely to yield sufficient interest on the entire investment.

From the sixtieth year on mature timber may be obtained from the best localities, yielding then (after Pinchot and Graves) 13,400 feet B. M. per acre. Inasmuch as the expense for acquisition and reforestation, administration and taxes is not made from loans, the forests will form the "Savings Box of the Commonwealth."

ADVANTAGE OF THE STATE FOREST SYSTEM THUS SECURED

The advantages of such a system of forestry are manifold.

First. All the sums spent for planting are money spent for common labor. The value of the plants, too, is nothing but money spent for gathering seeds, preparing nurseries, sowing seeds, weeding seed beds, etc., etc.,— consequently nothing but money distributed amongst the laboring people.

Second. The common laborer engaged in forest planting finds work at the season at which labor is not required in agriculture, building, etc.

Third. The harvesting and the manufacturing of wood and lumber will be a source of revenue to a large population after another two generations, such revenue being derived from lands otherwise barren.

Fourth. The public loans above mentioned will offer a good chance for safe investments. History proves that investments in forestry are safer than any other.

Fifth. The fishing and hunting interests of the state will be greatly benefited by the forests systematically protected and used.

Sixth. The example given by the state will act as a stimulus relative to conservative use of forest resources by the wood owners.

Seventh. The counties will obtain taxes from the land otherwise barren. Personally, I am strongly in favor of the state paying taxes on state forests to the counties and towns where such forests are situated. Of course these taxes should be taxes on the value of the soil *only*, just as in case of agriculture, and not taxes on soil plus crop. As an immature crop it has practically no market value, as revenue cannot be derived from it immediately.

For this reason I have included taxes on the land amongst the expenses in the calculations at the head of this letter.

POSSIBILITIES OF THE SPECULATION.

As regards the possibility of higher returns than those figured out to begin with, they may be expected with certainty.

a. If plenty of young healthy seedlings of valuable species are found growing on part of the area to be acquired. Every 1,000 seedlings thus found will save an expense of about $2.25.

b. If part of the land is of so good a quality that less than 5,000 seedlings per acre will be deemed sufficient for the formation of a forest.

c. If cheap labor (children) can be used for part of the nursery work and for part of the planters' work. At Biltmore the clefts in which the roots of the seedlings are imbedded are made by men, whilst the plants are inserted into the clefts by boys. Even on steep slopes and on clay soil, one man and one boy will plant 1,800 plants per day.

d. If the lumber prices and the facilities for transporting logs and lumber are increased in the course of the years. A change of conditions in that direction will also allow of a larger output of lumber, as logs having a diameter of less than 8 inches at the small end will be utilized to good advantage if the prices of logs and lumber are higher and if the freight charges are lower.

Under these circumstances the yield from thinnings will become valuable as well, especially in the better soil classes.

I consider the subject of reforesting waste lands in the state of Minnesota of paramount importance for the commonwealth for reasons which I need not explain to you.

ORCHARD LOCATION.

F. W. KIMBALL, AUSTIN.

I feel that it is desirable to put before as many as possible the features preferable in an apple orchard location. Many may be setting trees for the first time soon, and while I feel that all owners of land should set some, no matter what their location be, yet, I doubt not, many may set in a poor location while having better, owing to the fact that they have an idea that the failures have come largely from extreme cold, and think that if they have a good growth of timber on the north, east or west and open on the south, so the sun can lay in most of the day, that they have an ideal location, especially if the ground is sloping strongly to the south. So thought many of our best horticulturists previous to 1884 5. Observation has taught that the most successful orchards are those lying on a hill, sloping strongly to the northeast, in fact, the stronger the slope the better; and not so sheltered on any side as to prevent a free movement of air, except it be on the south. If on that side there is a strong protection to break the hot winds of summer and fall all the better. If a person has a choice of such locations, then let the soil determine. Let the tree have good soil, with good drainage, yet a subsoil that is retentive of moisture and on the slope mentioned; and especially if the surrounding country is considerable lower, then he has pretty nearly an ideal location. The further it is removed from this ideal the harder it will be for him to raise apples, but, as I said, set some, let the location be what it may.

CARE AND CULTURE OF APPLE AND PLUM TREES.

O. W. MOORE, SPRING VALLEY.

(Southern Minnesota Horticultural Society.)

I have been interested in fruit culture in the state for the past thirty-five years. I began here in Spring Valley in 1872. All that I have left of that planting is three Duchess apple trees. Five years ago this coming spring I began planting a young orchard of one hundred trees. My soil is what is commonly known as hazel brush land and clay subsoil and rock within about five feet of the surface. My varieties are mostly those recommended by our state horticultural society, all of which are doing well. My method of culture has been to cultivate to hoed crops for the first two years, mulching with stable litter (three-quarters straw), just after a few inches of snow. By so doing I am never troubled with mice, as they will not work under the mulch when placed on top of snow. As soon as the ground becomes workable in the spring, I remove all mulch and work the soil thoroughly, removing all grass roots within a circle of some six feet or more, after which I apply a dressing of wood ashes. I cultivate those circles about the roots of my trees about once a week through the months of May and June, after which time I return the mulch and protect the roots and retain the moisture through the hot and usually dry months of July and August. The balance of the ground between the trees I have seeded to red clover and alfalfa with good results.

In alfalfa we have a plant that when well established will last many years. Mine is three years old now and is improving every year. I am not troubled with June, or blue, grass working in, as alfalfa has a tendency to work everything else out. The first crop is ready for cutting about the time of our first red clover cutting, and in ten days, with favorable weather, the second crop will shade the ground. It is better to sow it early in the spring, that it may get a good start before dry weather. Do not sow it with any other crop, but by itself on a good seed bed. It puts down a long tap root into the subsoil, and will endure drouth after it becomes well established.

The Yellow Transparent is the only variety of apple that has troubled me with blight thus far, and that not seriously, but the apple gouger disfigured nearly my whole crop the past season.

I have a plum grove of fifty trees, of some ten different varieties. My method of culture is very much the same as that of my apple orchard, except that I have been cultivating the whole plat to hoed crops, and am now going to try mulching with straw deep enough to keep down all vegetation.

The aphis, or leaf louse, has been troublesome the past year, but by practicing Prof. Green's method of smoking my trees with tobacco stems I effectually cleaned them of this pest. My plan is to procure a light grade of muslin or sheeting, cut off and sew together, making a canvas large enough to envelop the tree; throw it over the tree and then throw dirt on the bottom (or two or

three small boys will do) on the further side from you. Have your ash pail ready and put it under the canvas with your tobacco stems fired and smoking. Smoke each tree about ten minutes, and you can give those aphis a free smoke that will do them up in short order; but caution must be taken in smoking young and low trees in not getting your fire too hot, as there is be danger of scorching the foliage. As to a test between different varieties of plums in regard to their hardiness, prolific bearing, excellence, etc., my orchard is not far enough advanced to make an intelligent classification.

CULTURE OF THE GOOSEBERRY.

M. C. BUNNELL, NEWPORT.

The gooseberry is a fruit that is generally used by the housewives, in different ways, utilizing it for jams and jellies, canning purposes, etc. The women say it makes fine jelly. Of course, it requires considerable sugar to make them palatable. My experience in making sales of plants shows that it is the leading and favorite fruit with the foreign population (that is, among the small fruits), I suppose on account of the taste they have cultivated for them in their native country, where they grow to a greater perfection. The large European gooseberry grown so widely on the continent has not been domesticated in the United States. However, there are several native varieties that are grown from the Atlantic to the Pacific and are prolific.

I would plant them a distance of six feet between the rows, and four feet in the rows so as to give plenty of room to cultivate them. Keep them from lying down on the ground as much as possible, and sufficiently trimmed so as to prevent mildew. Plant in good soil, well fertilized.

The Houghton and Downing are recommended for general cultivation, being good producers; other varieties, Red Jacket and the Pearl, for trial.

The gooseberry is subject to the ravages of the worm such as destroy the currants. The remedy for that is to apply hellebore, put on in liquid form before the worm makes its appearance. The old maxim is "an ounce of prevention is worth a pound of cure."

The plant is quite easily propagated from layers. It is a fruit that sells readily in the city, prices in St. Paul market for the season 1897-98 ranging from five to seven cents per quart. I might say that they are not as desirable a fruit to pick as other small fruits on account of the briers, but I consider them an indespensible fruit to the market garden and also in private gardens.

SOWING ONION SEED in hotbeds and transplanting to he field increases the yield and decreases the quantity of unmerchantable onions.

THE ITASCA STATE PARK.

GEN. C. C. ANDREWS, MINNESOTA STATE FIRE WARDEN.

(From 1898 Annual Report, Minnesota State Fire Warden.)

In August I spent a day looking over the Itasca State Park in company with the superintendent, and walked several miles through thick primeval woods. I saw some handsome exclusively pine forest, also considerable forest of large leaved trees mixed with pine, balsam and spruce. Though not as rich in forest as some other localities in the state, it is yet well enough wooded to make a desirable park, aside from the interest attaching to it as containing the source of the Mississippi river. Evidently there is much wild game in its limits.

The only means of travel through the park at present is by boat. Its benefit to visitors would be very greatly promoted by the construction of paths and roads, and as soon as practicable the state should employ a landscape engineer to lay out and construct a system of roads and paths. Such improvements would add immensely to the attractiveness and value of the park. Towards this park congress contributed as a gift 7,000 acres on condition that the state would protect the timber; and the only means for its protection from fire provided thus far, besides what the superintendent can do individually, is through the fire warden law. Another portion of the park, comprising 2,452 acres, was bought by the state, of the Northern Pacific Railroad Company, at fifty cents per acre.

The state is to be congratulated on the wise and fairly liberal action of the last legislature in appropriating $20,000 to purchase timbered tracts within the boundaries of the park which still belong to private individuals, and which, through lumbering, were liable soon to become denuded of forest cover, and in a way to expose the rest of the park to serious danger from fires.

The law making the above mentioned $20,000 appropriation further provides that in case said appropriation shall become exhausted, and it shall transpire that timber is liable to be cut from any land within the limits of the park, the attorney general shall endeavor to secure from the owner of such land an option to purchase the same, for a period not exceeding two years, which shall contain an agreement that the timber thereon shall remain undisturbed. He may pay for said option, if secured, a sum not exceeding four per centum per annum of such term, upon the value of said land as the same may be estimated by him. An appropriation of $1,000 was made to enable him to secure such option.

FLOWER LOVERS should make more of the petunia as a window plant. A well established root, dug from the garden in the fall, will be in blossom by the first of December and will keep in continuous bloom all winter. The petunia should never be allowed to get dry during the blossoming season. It has but one objection, and that is the roots are very fibrous and coarse, which makes transplanting difficult and a larger pot necessary. Not one of our garden favorites has of late been more grandly improved than the petunia. For house bloom at least I prefer the single flowers.

Shore of Lake Itasca from where discovered by Schoolcraft, July 13, 1832. A fine body of Norway and white pine. Photographed August 18,1898, for the Annual Report of the Chief Fire Warden of Minnesota.

Lake Itasca, looking south. Bear Paw point on left, Schoolcraft's island on right. Photographed 1898, for the Annual Report of the chief Fire Warden of Minnesota.

THE OWATONNA TREE STATION.

C. G. PATTEN, CHARLES CITY, IOWA.

While at a late Minnesota state fair, some of your leading horticulturists expressed a wish that I would visit the horticultural station at Owatonna and give my views of it for publication; and as the work of Mr. Dartt at this station is by no means new to me, I thought it might be of interest to a good many of your people to know how an outsider looked at it.

My visit during the week of your fair was the third time that I have had the pleasure of looking over the grounds in the last five years. Having for many years been greatly interested in horticultural experiments of my own, I could not but watch with keen interest the work of one with such positive ideas as Mr. Dartt, as those who know him best know that he is thoughtful as well as positive and earnest. It gives me pleasure to say that at every visit I have found the station in first class order.

Mr. Dartt seems to be as thorough in his work as he is definite in his ideas as to how it should be done. The conception and management of this station is unique; it is entirely Mr. Dartt's.

Some might complain that he has been too heroic in his treatment of his seedlings and the new varieties that have been submitted to him for trial. But whatever one may think of his method of testing varieties, everything has had an equal chance; there has been no petting of special sorts; and whatever passes the ordeal to which he subjects them no one need fear to plant.

The application of a liberal quantity of manure to young orchard and nursery trees, and the girdling process to which these new sorts, from two inches and above in diameter, have been subjected is a trial of the most thorough nature. Most men who are personally interested in new varieties would shrink from such a test.

It appears to me, at least at first sight, that the manuring and girdling for two or three years in succession are almost too much to expect a young tree to endure. But what are experiment stations for if they are not to develbp new ideas and processes and results.

Mr. Dartt conceived the idea that he could test the hardiness and vitality of new sorts as much in five years as has been done heretofore in fifteen to twenty years by the old way of waiting for cold winters and blighting summers. Hence, he used the manure to blight, and the saw to test the vitality of the tree. And while at the first inspection I had my doubts, it looks now as though he was going to demonstrate, at least to a large extent, the value of his practice. Of course, in experiments one has to vary seasons and methods as new developments appear.

The first impressions of "girdling" is that in throwing the young tree into bearing the fruit will not be a fair representation in size of what the tree under normal conditions would produce. But this, it seems, is only true where too large an amount of fruit is left on the tree, as I noticed that where the trees were not overloaded it was of good size.

Mr. Dartt believes that in gathering the "cream," as he puts it, of many originators in different parts of the country, that he is very

likely to do better service for his state than he could if he had spent all of his efforts in originating. He has, as before said, carried on the work with great thoroughness and on an extensive scale, having several thousand seedlings and varieties under trial.

Personally, I believe that I have learned how to get valuable results for two or three years from surplus trees in a too thickly planted orchard by "girdling" and "feeding" and compelling them to give down fruit before they must be chopped out. And I have no doubt that hundreds of orchardists will receive benefits and draw valuable lessons from Mr. Dartt's experiments.

PLUMS.

J. S. HARRIS, LA CRESCENT.

(Southern Minnesota Horticultural Society.)

Until within a very few years, writers on American pomology have paid but little attention to the plum except varieties of European origin (Prunus domestica) and their American descendents. This one species had seemed to satisfy the wants of the country until it was found that there was a vast region of country west of Lake Michigan and north of central Illinois and Iowa where they could not be successfully grown, and there, after repeated trials and failures for a long time, the native wild plum (Prunus Americana) was so abundant that little or no attention was paid to cultivating or improving a fruit that was so easily secured. Later the impression began to prevail that its nature was so wild that, like the indian and buffalo, it could not stand up before civilization. This impression arose from the fact that the crops in the groves and thickets were becoming more frequently a failure, and the size and quality of the fruit generally inferior to what it had been in earlier years, and trees from the groves taken up and planted near the homes seldom fruited as regular or produced as fine fruit as in their native surroundings. Men were slow to learn that the fault was not so much in the plum as in the so-called civilization. When nature attended the groves, the soil was kept moist, rich and loose by mulching of leaves and decaying of vegetable matter; when brought under the care of civilization, barbarizing influences surrounded them. Domestic animals trampled the ground in the groves until it could no longer absorb the water from rains and melting snows, and browsed and fed upon the foliage and new growth, so that the trees lost their strength and ability to bring a crop of fruit oftener than semi-occasionally, and that dwarfed and pinched by starvation. With rare exceptions, trees removed from the thickets to the dooryard or gardens fared no better. They were either continually trampled about and the soil kept like the beaten highway, or stood in sod that was impervious to air and water, were often browsed and run over by the farm animals, and never hoed, cultivated, mulched or manured.

There is something fascinating about the growing of plums, and notwithstanding the almost certainty that the domestic species cannot be successfully grown here, considerable quantities of the trees

are annually worked off upon our people at exorbitant prices by the tree agents from southern and eastern states. This ought not to be so, but the time, money and persistent efforts should be transferred from the nursing of an alien to the education and improvement of the native citizen. In a bulletin of the Cornell University, in 1892, Prof. L. F. Bailey says "since the introduction of the Wild Goose plum forty years ago there has been a steadily growing interest in the development of our native plums. The native species possesses certain advantages over the common plums of the prunus domestica type, and they are so widely distributed and are naturally so variable that they have been brought into cultivation under a great number of forms." He says further that, so far as he knows, "there has been no attempt to make a comprehensive study of these fruits, and, as a consequence, our knowledge of them is vague and confused, and, in fact, the native plums constitute probably the hardest knot in American pomology."

Until the present decade native plums have been grouped into two species—the American, or Canadian, wild plum (Prunus Americana) and the Chickasaw plum (Prunus Chickasaw); but within a few years Prof. Bailey has given them a careful study, and classified the Chickasaw under some four groups, viz: Miner group, Wild Goose group, Chickasaw group and Marianna group.

As none of these are sufficiently hardy to warrant their general planting in the northwest, we would advise the planters of Minnesota to let them alone, and apply their whole attention to planting the American group (Prunus Americana). This species is entirely hardy and embraces a great number of quite distinct varieties of great excellence that are found growing wild from New England to the Rocky Mountains, and from Manitoba to Texas; but up to the present time the best varieties that are being brought to notice have been found in Minnesota, western Wisconsin and northern Iowa, and it is probable that some varieties as good or better than any now known are entirely lost. I am of the further opinion that in the long ago our plum was cultivated by some people who inhabited this region before the indian, and it might have been advanced from further south and a fruit of a size and quality much superior to that of the present time. Every valuable cultivated fruit of the present day is believed to be advanced from wild originals or types that present no comparison in quality to the best of our plums, and a like improvement should give a fruit of rarest excellence. Thus far nothing more has been accomplished than the selecting of varieties, but now a number of specialists are at work, and we may expect that new and improved varieties will be brought out and follow each other in rapid succession.

We now start out with the assertion that every farm in the state ought to contain a plum orchard, and that no village garden is complete unless it contains a few plum trees. With proper care plums can be grown almost anywhere and on almost any kind of soil, but the most suitable and best adapted location and soil should be selected whenever it is possible to do so. The best location is undoubtedly a north or northwest aspect that has some pro-

tection beyond on the north and west, with good drainage, but where the soil is rich and moist. A good sandy loam is the best, but they will flourish on a strong clay loam where the ground is first well prepared and good drainage secured; and some good plum orchards are located on very sandy ground where mulching and fertilizers are freely used. The ground should be plowed and nicely harrowed before planting the trees, and if the place selected is new, unbroken prairie, it should be broken and cultivated at least a year before planting; but a clover and timothy meadow or old tame grass pasture will do by plowing in the previous fall and then again in the spring, but the sod should be thoroughly disintegrated by harrowing before the trees are set. The best trees are two or three years old, nursery grown, and those on their own roots always preferable to grafted or budded trees, for the reason that if any accident happens to the trees the sprouts that come from the roots will be of the same variety, and where a tree becomes enfeebled from age or excessive fruiting it can be renewed by cutting down and letting a young sprout take its place. Two or more varieties should always be planted and the varieties mixed, for two reasons: first, to extend the season of fruit as long as possible and, second, to insure the most perfect pollenization of the blossoms.

Take pains to plant well, setting a little deeper than they grew in the nursery. Firm the soil nicely about each tree and mulch before hot, dry weather sets in. Prune the tops back at the same time pretty severely, or at least in proportion to the loss of roots. For the commercial orchard I should set in rows twenty feet or more apart, and the trees in the rows twelve feet apart, and for the following two or three years prune or head back the new growth before buds start in the spring enough to keep the trees well balanced and shapely. Heads should be started low, or about two and one-half feet above the surface of the ground, and sharp forks that will split down should be prevented as much as possible. Catch crops of low vegetables may be grown between the rows for about three years; after that they had better have the whole ground, but for good results cultivation must be kept up and an occasional dressing of manure given.

Pretty good results can be gained by seeding to clover occasionally, mowing twice a year and using the crop only as a mulch. Small grains and timothy and blue grass must not be allowed to grow in the plum orchard, or the crops of fruit will soon become uncertain and the quality poor. The little plum patch for the garden may be planted somewhat closer, and in the form of a grove or thicket, but varieties should be mixed as for the orchard. The best of the older well known varieties are De Soto, Forest Garden, Cheney, Wolf, Rollingstone, Hawkeye, Weaver and Ocheeda.

The worst enemies to the trees are blackknot and borers. The worst enemy to the fruit is the curculio. I do not think the blackknot is, so far, very prevalent in this state. It is a contagious disease, and wherever it is found it should be cut off and burned. If choke-cherries in the neighborhood of the orchard are affected with the blackknot, the spores of the disease will attack the plum.

Therefore, all such diseased trees should be promptly destroyed. The larvæ of the plum tree borer and also of the flat head apple tree borer and the peach tree borer, often do considerable damage in plum orchards by gnawing the inner bark and new wood of the tree. The tree should be examined every autumn and again in the spring, and all borers dug out with a sharp pointed knife. In order to find them readily the soil should be drawn away from around the trees, but it must be replaced lest the trees receive injury from the winter. Under all circumstances the larvæ should be destroyed, and that will generally prove sufficient, but in localities where they are very troublesome it will prove still more effective to apply some hand wash that will prevent the deposition of the eggs of the perfect female insect. This is best done about the first of July. One of the best washes is made by thinning down soft soap to the consistency of thick paint and adding a tablespoonful of crude carbolic acid to a gallon of the wash.

The length of this paper permits no more than a brief description and life history of the curculio, which has long been so great a dread to the plum grower. The insects appear about the time the trees are in blossom, or a little before, and as soon as the fruit is formed deposit one or more eggs in each. The eggs generally hatch in four to seven days, the larvæ being small, white grubs. They reach full size in four or five weeks, and after full grown emerge from the fruit and enter the ground to the depth of several inches, where they change to pupæ and in the course of six weeks become perfect insects or fully developed beetles. In this form they pass the winter hidden under the rough bark or other cover and come out in the spring ready for work. Frequent cultivation at the time they are entering the ground destroys many of them. If hogs can have access to the orchard to devour the fallen fruit many more are destroyed, and, in addition, jarring the trees and catching them on sheets, and burning or scalding is the most effectual of all remedies. Spraying with Paris green or London purple is strongly recommended by some parties. If spraying is done, the first should be as soon as the blossoms fall and repeated about twice a week or ten days apart.

In packing apples, be sure that it is done in such a way as to keep the apples firm in the barrel.

PICKING AND MARKETING PLUMS.—I use sheets about twenty feet in diameter, which I spread under the trees in the morning, then by a few vigorous shakes of the tree the ripe plums fall. Now by raising the outer edges of sheet, the fruit is gathered in the center, where it is easily and quickly picked up into baskets. For marketing I use new, clean peck or one-half bushel baskets. Always have your packages neat and of uniform size. My own experience justifies me in believing that an enterprising person, not too far from market, may make a fair and very possibly a large profit from growing plums.

KEEPING APPLES.

CLARENCE WEDGE, ALBERT LEA.

(Read before the Southern Minnesota Horticultural Society.)

Now that we have learned that by planting varieties adapted to our climate and giving them treatment that shields them from the peculiar hardships which they are obliged to undergo, we can raise an abundant supply of apples, the next question that interests us is how can we make the most economical use of the fruit we have learned to grow. Nearly all the varieties our state society is thus far willing to recommend are fall and early winter sorts. The only really hardy all winter keeper outside the trial list is the Malinda, and that is handicapped with two important failings: first, it is an extremely tardy bearer, and, second, it is of only secondary hardiness, a very bad combination for this climate. If our orchards are like most of those already fruiting, bearing only the fall varieties, like the Duchess, we still do not need to be without home grown apples for a good share of the year if we live near a town where there is a cold storage plant; for we find that if the fruit is picked with great care just as soon as ripe and placed in cold storage without any bruises or rough handling it will keep until after midwinter in perfect condition. Indeed the Duchess makes a far more palatable eating apple when kept in this manner than it is when freshly picked from the tree. We find also that a barrel of Duchess taken from cold storage in January will keep without decay for several weeks in an ordinary cool house cellar. We have paid fifteen cents per barrel per month for the small quantities we have had so stored, and considering the poor quality and high price of the apples usually found on our markets we have generally found it an economical venture. But our people are now beginning to have quite a little surplus of the Wealthy, and are likely to soon have still larger quantities of the Hibernal and Longfield, varieties that in our latitude may with proper treatment be kept until February, but with careless and ignorant handling may be half spoiled in a month after gathering. None of these rich, mellow fleshed varieties will keep until cold weather if allowed to drop to the ground before picking. The same care should be taken in handling as with the summer fruit, and all wormy or diseased apples rejected. After the apples have been properly picked, the common mistake is made of placing them immediately in the cellar, which at this time of year is the worst possible place. A clean, cool shed or outhouse is the best place for them to remain until there is danger of freezing weather, when they may be removed to the cellar for the winter. It is probably best to allow the boxes or barrels to remain open for a few days after placing in the shed, but they should soon be closed up tight to prevent too much drying out and to protect from rats, mice and——the boys. We have not tried a straw shed but have been told that such are cooler and preserve a much more even temperature than a board shed, and we are so far convinced of its merits that we propose to try a straw shed next season. A moist cellar is preferable to a dry one for keeping apples, indeed one excellent

western authority says that a cellar cannot be too moist for apples.

We cannot close this paper without a word of encouragement to orchardists in southern Minnesota. We have seen numbers of fine healthy trees of the Duchess and Wealthy on the prairies more than a hundred miles northwest of where we are met today. Many of these trees measure over two feet in circumference of stem and are bearing very profitable crops. We found one orchard alone in Yellow Medicine county from which there was sold $200.00 worth of appples in one season. If so much has been accomplished on the God forsaken, wind-swept prairies, intended only for the home of the grasshopper and buffalo, what shall be said of the farmer in grand old Mower county who has not sand or sense enough to raise an orchard for his own comfort, and for his boys and girls to enjoy and look back upon in later years as the pleasantest spot on the dear old home stead?

Calendar for November.

O. M. LORD.

If the ground is not frozen, it is not too late to set blackberries and red raspberries. It is not advisable to set any other fruits in the fall in Minnesota. If other fruit plants or trees have been received, it is better to heel them in till spring. The grape vines may now be trimmed and laid down, though the ground be frozen. A light covering to hold the vines down is necessary. Of course, all garden vegetables and seeds have been secured in the fine weather of the last month. It is well to make the young apple trees secure from mice by making a mound of earth, a few inches high, around the base of the tree, and also removing all grass and weeds from around the tree. As soon as the ground is frozen, the strawberries will need covering. The October frosts, this year, have not hurt the vines, but the ground in this vicinity is very dry, and the earlier the mulch is put on the more moisture will be retained for the plants. All fruits in Iowa, last winter, suffered from root-killing more than in Minnesota, but we are liable here to sometimes have a winter without much snow, and the mulching, in such cases, will be helpful.

Rabbits are sometimes very destructive in the winter, and it is well to be prepared in time. Wrapping the trees with woven lath or wire screen or burlap cloth will be effective, and even newspaper, though not so durable, will answer. All kinds of washes are so liable to be washed off by rains that they are not worth the trouble to put them on.

Apple scions are usually cut in this month and packed away for winter and spring grafting. Plum scions are more reliable if cut near the time of using. Winter grafting of the plum is not as successful as spring grafting. The planting of plum, cherry and apple seeds, if not already done, needs immediate attention, or the seeds may be stratified in moist sand and left out of doors for freezing for spring planting.

Secretary's Corner.

BRING A PECK OF WEALTHYS TO THE MEETING.—Don't neglect to pick out a peck of the best Wealthys in your cellar and bring to the annual meeting. You may or may not win the prize offered, but you will be sure to help on the good time we shall have sampling them.

THE BEEKEEPERS MEET WITH US.—As usual, the State Beekeepers' Association will hold their annual meeting at the same time and place as the horticultural society. They are a lively crowd in themselves, but wherever up against the forestry people and horticulturists under one roof there is bound to be a busy time.

ANNUAL MEETING, MINNESOTA STATE FORESTRY ASSOCIATION.—This organization has changed the date of their annual meeting to bring it at the same time as that of the horticultural society, and it will be held this year also at the same place, and one session of our our society will be taken up with topics relating to forestry, to be treated by members of that association. This arrangement will, we are sure, be mutually helpful.

LECTURER ON HORTICULTURE AT FARMERS' INSTITUTE.—Hon A. K. Bush, of Dover, will occupy the post of lecturer on horticulture with the farmers' institute the coming winter course. It will be remembered that Mr. Bush filled this position very acceptably two years since. Last winter he served our cause equally well as a member of the lower house. Our readers may expect to hear from him through the Horticulturist when the work opens.

THE SECRETARY'S LIBRARY AND OFFICE OPEN EVENINGS.—To give visiting members an opportunity to examine the library of the society and meet the officers of the society at their official home, arrangements will be made to keep the office open evenings during the continuance of the annual meeting. The office is not too large to prevent sociability, has plenty of chairs and is well lighted. Don't miss this opportunity to drop in and see how it is done.

ANNUAL MEETING OF OUR SOCIETY.—The first Tuesday of December, which according to our constitution is the date of our annual meeting, falls this year on Dec. 5th. The meeting will be held in Minneapolis and continue in session four days. In general it will be a counterpart of the preceding meeting with a change of topics and speakers. Of one thing be sure, we shall have a large and enthusiastic meeting, and no one who can attend should fail to be there.

NORTHEASTERN IOWA HORTICULTURAL SOCIETY MEETING.—The next annual meeting of this society will be held at Cresco, Iowa, November 26th, 27th and 28th. Mr. F. E. Fryer, of Mantorville, has been selected to represent this society. As the place of meeting is to be so near the border line of our state, it is likely that a number of our members may find it convenient to attend, and we hope they may while there succeed in enticing some of the Iowa brethren to our coming annual meeting.

THE $1000 SEEDLING APPLE PREMIUM.—Copies of the regulations were sent out early in October to twenty-eight informal applicants and 150 horticultural and agricultural periodicals throughout the country. Seedlings of the kind asked for are not very plentiful, and the commitee do not expect to be overrun with formal applications. The following members compose the permanent committee on award: Prof. S. B. Green, St. Anthony Park, Minn., chairman; J. M. Underwood, Lake City; J. S. Harris, La Crescent; Clarence Wedge, Albert Lea; A. K. Bush, Dover.

PROGRAMS WILL BE SENT TO MEMBERS.—Notwithstanding the program will appear in the December Horticulturist as usual, a copy will be sent to each member about the 15th of Nov. This will give those on the program an opportunity to note their position therein and arrange beforehand to be in attendance promptly. Don't forget to put the program in your pocket and bring it to the meeting. The programs will be accompanied by a renewal card, and it will assist the secretary very much if members will at once remit the annual fee for the coming year, before the convening of the annual meeting.

HEADQUARTERS AT ANNUAL MEETING.—Hotel Vendome, the same hotel that has been used as stopping place for our members the past two years, will be the headquarters again for the annual meeting convening December 5th to 8th next. It will be found to add very largely to the pleasure of the social feature of this gathering if the members are brought together here very generally. There being no evening sessions of the society, the parlors of the hotel are made the place of the liveliest social intercourse. Bring your grip for a four days stay, and put up with us at the Vendome and have a good time. The rates will be the same as last year, 50 cents to $1.00.

BULLETIN ON "ROOT-KILLING OF APPLE TREES".—Prof. N. E. Hansen, well known to all Minnesota horticulturists as the professor of horticulture at the South Dakota Experiment Station, is the author of a bulletin just issued from that station with the above title. It is intended as a review of the experience at the station and contains besides many observations and suggestions as a result of the professor's opportunities of noting how this problem is being solved in the countries of northern Europe and Asia. It makes a very good compendium of what is known on the subject in the northwest at this stage of experimentation. Anyone interested in this subject, as all orchardists must be, should secure a copy of the bulletin from the professor and give it careful reading. Address at Brookings, S. D.

Peter M. Gideon died at his residence, in Excelsior, Minn., Friday morning, Oct. 27, 1899. Obituary in December number.

The Wisconsin Horticulturist, in the Oct. No., just received, announces the death of M. A. Thayer, the founder of the Thayer Fruit Farms, at Sparta, Wis., and for many years president of the Wisconsin society.

THE BERRY PLANTATION OF GEO. R. WILDER, CHATFIELD, MINN.

THE MINNESOTA HORTICULTURIST.

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THE MATTED ROW SYSTEM OF GROWING STRAWBERRIES.

GEO. R. WIDGER, CHATFIELD.

A strawberry crop is very uncertain in this section of the state, and I have not had very good success with the exception of two years, those of 1893 and 1897. In the year of 1893 I raised 2,100 quarts from less than one-half an acre; in the year 1897 I raised 8,000 quarts from two and one-fourth acres; both years on new land. My land is high and clay soil.

I plant in rows four feet apart, fifteen inches apart in the row. In setting out plants I use a spading fork. I prefer a fork instead of a spade, because a spade leaves too smooth a surface and packs the soil on both sides. I insert the fork in the ground the full length, and push it forward while another puts the plant in. He holds the plant in place while I press my foot firmly on the roots just below the crown. Soon after setting I commence hoeing and cultivating as often as every week or ten days. When the rows commence matting I hoe them just the same. I loosen the dirt among the plants and leave not an inch of ground unworked. Fifteen inches is wide enough to let the rows spread. I never thin them out, and I never do much weeding by hand, it does not pay. I do all the work with a hoe and cultivator. If my strawberry bed gets too grassy, I plow it up and set anew; it can be done cheaper. I do not wait for weeds to grow; I never allow them to get started. I plant one row of staminate to two rows of pistillate.

I have had the best success with the Bederwood and Lovett for the staminate, and the Warfield and Crescent for pistillate. The Bederwood and Warfield together have done the best with me.

If there is a prospect of a frost I do nothing to prevent it from hurting the strawberries. I tried a few times to keep off the frost with smoke, but it did no good. After picking I mow the bed and burn it over, then plow a back furrow between the rows, then drag it lengthwise, then crosswise until it is very smooth; then after the plants begin to show above the soil, I commence hoeing and cultivating the same as I do new plants.

RURAL CEMETERIES.

FRANK H. NUTTER, LANDSCAPE ARCHITECT, MINNEAPOLIS.

From the very dawn of history the spot where loved ones have been laid away has been a sacred one to those who still lived, and whether it be some Westminister Abbey, the resting place of the wise and great, or some secluded nook where "the rude forefathers of the hamlet sleep," it has been the shrine of some loving pilgrim. Many of the most celebrated relics of the arcient world, as the Egyptian Pyramids or the "Taj Mahal" of India, have come down to us as the tombs and monuments of the royal builders or their families, whose names it has thus been sought to perpetuate.

Whether, however, the attempt be made by means of a magnificent tomb or monument, or by an humble headstone, to commemorate those who have left us, the lapse of time and the forgetfulness and neglect of those who remain too often involves the whole in a ruin which appeals most pathetically to the observer. If the saying of Franklin be true, that by the condition of the cemetery we may judge of the civilization of the neighborhood, many a village and town must be well sunk in barbarism.

It is encouraging to note a decided awakening in the public mind in this direction, and the question of the improving of old cemeteries and the laying out of new ones is often discussed, and the ladies' organizations in not a few of the smaller cities and towns are doing valiant work in this direction.

The "modern cemetery," as that expression is now understood, is of comparatively recent date and, also, of American origin. The most celebrated examples of this class, as Mt. Auburn, Greenwood and Spring Grove, are situated near large cities, and for some time it was thought necessary for the successful maintenance of a cemetery that it should be located at some center of population and wealth; but this has proven false, and many a country town or village now boasts of its small but attractive cemetery, and while, of course, it may not exhibit the extravagance of monumental art, too much of it falsely so-called, that is found in the large cemeteries, still its quiet shades and modest adornment, if properly cared for, will be to a person of real taste and discernment far preferable to the more gaudy settings of the others.

In recognition of this demand the legislatures of most of the states have taken special action in regard to the organization and the management of cemetery associations and the safeguarding of the funds devoted to "perpetual care," which last may be called the supreme factor in the modern cemetery. A careful study of the principles of these laws is the first thing to be entered into if the organizing of an association is contemplated.

It having been decided to proceed with the project, the next thing, of course, is the selection of the site, which will involve questions of area and adaptability to burial purposes; and while a picturesque location is desirable, that natural beauty and retirement may characterize the cemetery, it must not be overlooked that there are also principles of ordinary business prudence to be regarded, and the

cost of both construction and maintenance, and the proportion of the whole tract which is suitable for burial purposes, from which the income must be derived, should receive careful consideration.

The so-called "lawn method" of laying out the cemetery is that which is now followed, almost without exception, and even in the larger and older cemeteries, which were originally platted in a more artificial and gardenesque style, the later additions are being laid out in this way. Briefly described, the "lawn method" is as follows: All footpaths of gravel are omitted, except under very special and unusual circumstances; the drives are so located as to follow, as far as possible, the natural topography of the ground, and to enclose "sections" of such size as to be of convenient access in every part; these sections are subdivided into lots of the desired dimensions, each lot having a frontage on the drive or on an alley or path crossing the section; the alleys, however, being kept on a grade with the lots and sodded, so that the entire section shall be to the eye a lawn; the corners of the lots to be designated by markers of some indestructible material set flush with the ground, and all the demarkation by means of fences, curbs or graded borders to be strictly forbidden.

While this may seem, to those accustomed to the old-fashioned "burying grounds," a wide departure, there are still a few other rules which, if enforced, as they may be where the community is sufficiently educated artistically to appreciate their reasonableness, will add much to the beauty of the grounds.

Briefly set forth they are:

First—But one monument or piece of statuary to be set on each lot.

Second—No foot stones to be used and each grave to be designated by one stone marker of modest dimensions firmly set on a proper foundation at the head or, better yet, set horizontally and flush with the surface of the lawn.

Third—No mounds to be raised over the graves, but all to be finished to the general level of the ground.

Other rules governing the constructions of tombs and foundations for monuments and markers, and the planting or removing of trees, shrubs and flowers, and other details of the work, will in practice be found necessary.

While this may seem to those accustomed to the ordinary haphazard methods to involve a needless amount of red-tape and dictation on the part of those in charge of the cemetery, they are all founded on good and sufficient reasons, and when inspecting a cemetery conducted on these lines, with the numerous unoccupied corners and fractional lots left in the platting, ornamented with flowering shrubs and plants, and bordered with tastefully arranged and neatly cared-for plantations of native trees and shrubs, we may well believe that it was of some such spot the poet spoke when he said:

"Be my last rest from life's alarms
Not in the thundering surges of the seas;
Not in the city's din, but midst the calm
And sacred silence of such shades as these."

POINTS FOR THE AMATEUR ORCHARDIST.

J. B. MITCHELL, CRESCO, IOWA.

(Southern Minnesota Horticultural Society.)

To start right in planting an orchard, the first thing to do after having got your ground in good condition, as for corn, is to get the right kinds of trees to plant and get them in the best possible condition and handle and care for them as things of life.

You can not do better than to get your trees of the nearest nursery, getting such kinds as you find doing well near where the orchard is to be planted, and those kinds to be found in your home nurseries. Your success in horticulture is to your home nurseryman's best interest, and you must give him credit for ordinary intelligence. You must know that his study is to find and test kinds best adapted to his climate and soil. He is in a position to know of all new varieties as they are brought forward, and able to judge and select for trial such as have merit, and what he can not furnish it is quite safe to conclude you do not want.

When transient tree men, from distant states, offer you new or old sorts at fancy prices and tell you that your home nursery is a "one horse" concern and does not have these kinds, remember "talk is cheap," and the more he talks the cheaper it gets, and that now you are close to the danger line; that if his plausable story and smooth tongue induce you to give him your order for one of his "model (?) orchards" or his wonderful trees, he has indeed caught a "sucker," and the day for yourself and children to pick fruit from your own tree and vine has been postponed for another trial.

Barnum said the American people liked humbug. This apparent trait of the people is in a large measure responsible for the slow progress made in horticulture in the northwest. But the dawn is breaking in the North Star state. The fair prairies of southern Minnesota have already demonstrated their capability of producing as fine and high colored apples as are grown on the American continent—and the American continent beats the world.

This success has not been attained by planting eastern or southern varieties of the apple. It has been accomplished by planting the hardy northern sorts that are to be found in most northwestern nurseries.

The number of very valuable kinds for planting here is not large but is quite sufficient and on the increase. There are some seedlings from Minnesota and northern Iowa worthy of your attention, but you should only plant largely of the few kinds that you find doing best near you. The two most promising of these, I will venture to say, are Duchess of Oldenburg and Hibernal (or Lieby). These seem to do well in nearly all northern localities, regardless of conditions except good cultivation and care.

The Wealthy is a Minnesota product. It is a fine apple and a good tree in some localities but sun scalds and blights in others, and should only be planted on high ground open and sloping to the north, a position which is found best for all apple trees.

In my experience I have not found any of the old American apples hardy enough in tree to recommend for general planting in this

trying climate, but think quite a number of them may be successfully grown in Minnesota if grafted in the tops of more hardy kinds, but their grafting should be taught in the public schools. It is a simple process and requires but a lesson or two to learn it and would be of much value to horticulture.

Of the Russian apples other than mentioned above that I have had experience with and find good are Bergamont, Lubsk Queen, Watermelon, White Queen and Yellow Sweet.

Yellow Transparent is one of the first early apples, but subject to blight if planted where air circulation is bad, but, its being an early and heavy bearer, I would recommend planting it if it can be given a northern exposure.

These are some of the kinds I find doing good, but you will have success with such other kinds as you may find doing well in your own vicinity, and the safest plan is to plant such as you may know are doing well near you; but above all avoid in this trying climate buying trees from parties whose only interest is to get your money and leave you to repent at your leisure, as too many have recently done around you.

There may sometimes be a bug on any trees you get, but the "humbug" is the main cause of many farmer's not growing their own apples. Look out for him!

I had intended to give some points in planting and care of trees but now find my time quite limited, and if I have succeeded in inducing a few more planters to use the same good sense in their horticulture as they do in their other farming, I shall feel that I have done something to place more of this home grown, delicious fruit within the reach of the fair sons and daughters of these festal prairies and in return for the cordial invitation to participate in the noble undertaking of this society to advance Minnesota horticulture.

THE NURSERYMAN'S INFLUENCE IN HORTICULTURE.

C. G. PATTEN, CHARLES CITY, IOWA.

(Southern Minnesota Horticultural Society.)

If we consider the number of nurserymen who are actively engaged in the business in any or all of the western states, or even in the whole country, and compare their numbers with the vast extent of territory that they occupy, one might easily underrate the influence that this class of men wield in horticulture. But I am free to say that I am of the opinion that directly and indirectly their influence is greater than that of all the horticultural editors and writers combined. Everywhere over the broad prairies, in the forests that are being opened to cultivation, away on the outskirts of the newer territories, on the hills and plains and in the valleys of the mountains, everywhere the irrepressible "tree agent," directly or indirectly the representative of the nurseryman, is found. It is true that in a large way the "tree agent" represents only himself or some "commercial agency," but many of the nurseries keep in the field from twenty-five to one hundred and even five hundred men, and it cannot be denied that this great army of men by their personal and

persistent solicitation must wield an immense influence either for good or for evil in horticulture, and I feel certain that this influence has never been properly considered or understood even by the nurserymen.

The nurserymen have not properly considered or understood the weighty moral obligation that they are under to the public. For through this great army of personal solicitors they mould an influence over the common people as no other force possibly can do. They reach hundreds of thousands of people that are not reached, or if so in a limited way, either by the horticultural editors or writers. The moral aspect of this question has not, I am sure, been fully considered. Indeed, this is by no means the only subject where the weightier matters of equity and righteousness have been for a long time overlooked in the ever present struggle for existence.

It requires a powerful effort on the part of the best people and the best minds of the age to educate and bring up the public mind to a high standard of moral excellence so that it will recognize the fact even in a business sense that the *right way* is the *best way*.

In horticulture behind the great number of solicitors stand the nurseryman, the florist, the gardener and the special horticulturist and pomologist. And if for a quarter of a century past these men had properly weighed their influence for good or ill, there cannot be the least shadow of a doubt that the whole nursery and horticultural business would stand upon a much higher plane than it does. One of the greatest obstacles that has confronted the nurseryman and the horticultural public has been the lack of sufficient knowledge and appreciation of the great value of *adaptation* of varieties of trees, shrubs, vines and plants to special localities. And as hinted before, the nurseryman has not sufficiently considered the men or the methods used in securing trade for his products, or the character of the commercial or middle man to whom he sold his stock, whether he was a man who was upright in his dealings, or whether he was the most conscienceless scoundrel who was ever permitted to prey upon the public.

There should be more community of action and more unity in business among nurserymen. The practice of sending out untried novelties with such over-wrought descriptions that it amounts to little less than positive falsehoods and preconceived fraud, should be frowned upon and most severely denounced, whether it comes from the weakest itinerant salesman or from the most opulent and highly respected advertiser.

Nurserymen should demand as a first requisite in a solicitor that he must be honorable in his dealings. Nurserymen should also combine with each other to maintain good living prices on all well known valuable varieties throughout the entire list of horticultural products, to the end that they may have something above the necessities of every day life, so that they may properly test all new varieties, and by thus doing protect their patrons and be able to give them value received for what they buy.

Again, that important factor in the problem of successful horticulture, namely:

Adaptation of *varieties*, should receive at the hands of state and

national nursery and fruit growers' associations the most careful and conscientious consideration, and these several bodies should insist that any nurseryman who did not manifest a high regard for this most important line of work was not in touch with the best methods and the best interests for the promotion and elevation of this "science that doth so mend nature."

AN EFFECTIVE CURCULIO CATCHER.

The curculio attacking quinces, plums, peaches and a few other fruits is but little affected by spraying mixtures of any kind. The mouth parts of the insect are enlongated in the form of a beak, and when the curculio damages the fruit very little if any of the poisonous substances which may have been applied in the spraying solution is taken into the system. The most effective means of combating the insect, therefore, is to take advantage of its habit of dropping to the ground when alarmed. If a cloth is spread under the tree and the limbs struck with some kind of a pole, the insects will drop at once onto the sheet and can be collected and destroyed.

Placing the sheet about the trees is a slow process. Consequently the Cornell station has suggested the following device: It consists of an arrangement built on the plan of a double-wheeled wheelbarrow with a much elongated axle. On this is arranged a number of projecting arms radiating from a point midway between the two wheels. A canvass or any kind of cloth is attached to these arms with an opening on the far side large enough to admit the trunk of a tree. This is very inexpensive and easily built.

The time to begin jarring is still a question, but as the curculios are usually more active in the early morning, possibly the work had best be done then. These beetles begin operations as early as May, and it will not do to delay jarring them much after they appear. Some years they will not disappear until the latter part of July. Those who practice this method successfully jar the trees every day until the numbers are so small that they do not affect the fruit seriously. In one orchard noted by the Cornell station in 1897, 200 curculios were jarred from seven trees, and it is not uncommon to get as high as fifty from one tree at a single jarring. This process involves considerable labor and expense, but it costs only about fifteen or twenty cents per tree for one season. After the insects are captured they can be destroyed by the most convenient method. Some put them in kerosene or boiling water, while others have a charcoal stove built for the purpose in which everything that falls on the sheet is burned.—Orange Judd Farmer.

GROW NEW FRUITS SPARINGLY.—It is not advisable to try many new fruits until they have been thoroughly tested. Most states have horticultural experiment stations, operated by the state horticultural society, and every state has a government experiment station, where novelties should be tested before they are tried on the farm on a large scale. It will do no harm to grow a few new plants to see what they will do for you in your locality, but do not spend much money on them.

THE MULCH VS. CULTIVATION.

J. O. BARRETT.

(A reprint from the "Northwestern Farmer.)

Notwithstanding the authorities, only experience settles the mulch question. That success follows its usual application is no doubt true in cases where conditions require it, and it is equally true that in other cases it is a positive failure. Where the soil is well mixed with sand, preventing baking, there is a virtue in the mulch in that it measurably prevents undue evaporation of moisture in the soil. But even then, if nothing more is done for the plants, they may "live at a poor dying rate." As a rule, men depend on it solely to keep their plants healthy, just piling round the manure and doing nothing more. An English horticulturist avers that "mulch is the subterfuge invention of the lazy American."

For many years I have tried the common mulch, straw manure, to protect my trees planted in a black loam beneath which are nothing but gravel and sand, and they have almost invariably perished under the treatment. Meeting with continued losses year after year though I replanted every spring and again piled on the manure, I at last abandoned the nasty stuff that so disgraced the lawn and garden and was certain to prevent the ingress of water from a casual shower; plowed under some well rotted manure, cultivated the soil faithfully, and, presto, change, my trees and all my plants generally have rejuvenated under the old time regime. They now survive the summer heat and the wintry chill. I also tried a similar mulch on my prairie farm, that has a clay stratum under the black soil, and my trees lacked in the vigor which they exhibit now without the mulch.

What neutralizes the virtue of the mulch in the prairie part of the state where I live is the tendency of the soil (having in it an element called gumbose) to form a thick, hard crust during hot, drying seasons. It forms under the mulch just as hard as outside of the mulch. The mulch then is surely a peril, for it adds to the smothered condition of the roots. The root must have a circulation of air the same as the leaves. If strongly encrusted, the plants perish the same as they do when the roots are planked or cemented over by the sidewalks of the city. We can rescue our plants if we early throw off the mulch when the crust is forming, break it up fine, water the famishing roots and let in some air. But why permit such conditions of soil by the "hug" of the mulch? Any one can see that this is running a needless risk and is more work than "the good old way" of management by having no mulch on at all. In lieu enrich the soil below the surface, subdue all weeds and grasses, and keep the soil light and permeable by frequent stirring, thus manufacturing the fine and efficient "dust blanket."

As a rule, I do not think it wise to plow manure under for forest trees, unless the soil is very sterile. Generally our prairie soil is already rich enough for such trees. But apple trees and small fruit plants need richly manured soil to feed upon and amply reward us with fruits. For such put the rotted manure down where the roots

are. By the plow and harrow scatter it about within the soil. These manure nuggets, so to speak, are absorbers and detainers of moisture that comes up from below by capillation due to surface culture, and is easily absorbed through the dust blanket from the summer showers.

DEFORESTATION AND ITS RESULTS, AS THE FISHERMEN VIEW IT.

FRANK H. CARLETON, MINNEAPOLIS.

Twenty years ago Minnesota was a fisherman's paradise. Until the destruction of its forests began, Minnesota was famous throughout the country for its numberless lakes and streams of clear, cold water, teeming with the gamiest and most edible of fish. The temperature of its land and water was such as to promote the propagation, growth and development of the greatest abundance of solid and deliciously flavored fish, so unlike the soft, flabby and tasteless fish of regions south of us. A generation ago the great system of lakes, marshes, springs, rivers and giant forests which went to make up and protect the sources of the great Mississippi had no parallel in the United States east of the Rocky mountains; while the lesser systems of the Minnnesota, the Red River of the North, and the St. Croix and their tributary lakes and streams, were great sources of water of which many nations would be proud and desirous to conserve.

But with the destruction of the forests of Minnesota, the same results in the diminution of water supply have followed as in the older countries of the world where forest destruction has gone on, and we are but repeating history. The lakes and rivers have receded, the springs have dried up, the rainfall has decreased, and the atmosphere has lost much of its humidity. That water shrinkage has been exceedingly large is a fact known to every observer. Today Minnesota is full of dried up lakes and streams. As we ride through the country we see from the car windows grass growing in what a few years ago were beds of large bodies of water, where fish were once abundant. As I read these sentences, each of you can recall lakes and streams which have seriously declined in depth and size or have dried up all together. Stand on the beach of almost any lake in Minnesota and cast your eyes shorewards, and you can easily see the shore line of a generation ago, when the water stood six, eight or ten feet higher than it does today. But this is not all, for from year to year we can see that the drying up process is still very rapidly going on. Many of the lakes have become grass plots, and many brooks have widened into broad expanses of sand or gravel, over which in the summer season we pass dry shod. The interesting address of Walter C. Brower, which has been published by the Minnesota Forestry Association, describes in a most authenticated manner the extent of water decrease in Minnesota and is worthy our most careful consideration.

As agriculturists you know how quickly an unprotected hill loses its soil. The rain is not stored in the earth to feed perennial

springs, but it runs off in torrents bearing away a portion of the vegetable glebe and rich surface soil, and the freshets of spring soon take the rest; and you know that this soil which is thus washed away is the rich organic mold which the earth most needs. One severe storm may wash away in a week the rich fertilizing matter which it has required centuries to accumulate.

It has been estimated that not less than ten per cent of our soil is carried away by rills, streams and floods. During the present week, as I have seen farmers patiently hauling loads of manure from the stables of the city to place upon their lands, I have thought seriously of the fact that the torrents and floods of the coming spring would doubtless strip their lands of more fertilizers than they could haul to their lands in manure carts in a month of patient labor.

But this loss of the richest part of the soil is not to the land alone. Let me ask you where is this rich soil mostly carried by the torrents and floods? Is it not into the beds of the lakes and streams, where it is not only not needed, but where it is a positive injury, choking the channels of the rivers and streams and forming large sandbars in the lakes, thereby greatly reducing the depth of water, if it does not entirely overcome it? And just here, saying nothing about the serious loss to the land, a great damage is done to the fish. The clear, sandy, gravelly or rocky bottom of the lake or stream which the fish love and on which they feed and have their spawning beds, is covered with rich mold from the fields, forming a muddy sediment, which the fish do not like, and the feeding grounds and spawning beds are greatly reduced and often destroyed. The deep holes where fish resort are filled up, and the lake or stream is made shallow. Moreover, the water vegetation, on which the fish feed at certain seasons, is covered with the washings from the land and is destroyed, and another source of food for fish is annihilated. This last proposition that the accumulation of soil and mud in the bottom of streams is inimical to fish is true of all the higher grades of fish, but to it there is one exception, and that exception is as to catfish, called in common parlance bullheads. Bullheads thrive in muddy bottom and increase to an alarming extent. They are the gluttons of our waters. But beware of them, for when they once get possession of the waters, it will not be long before the best varieties of fish disappear.

GERANIUMS FOR WINTER BLOOMING.—Let the geraniums rest from July until September is past with but little moisture and no fertilizer, pinching off all buds. This means those for winter blooming, as the most shapely and best flowering are chosen for the sunny window next winter. The first of October fill pots with a rich sandy loam and in them place the geraniums chosen from the garden, set in a dark place for one week, then bring to the light, water with good liquid fertilizer and soon they will be a mass of bloom. One to two year-old plants are best.

PROGRESS IN HORTICULTURE.

J. S. HARRIS, LA CRESCENT.

We are happily living in the most progressive age the world has ever known since the beginning of time. The nineteenth century, even the last half of the century, has been the harvest of the ages in wonderful discoveries and inventions that to us appear to have a direct bearing upon the weal of the human race. It has witnessed greater advances in the arts, sciences and inventions, and greater progress in agriculture, horticulture and all those things that lead to refinement, higher civilization, greater comfort and truer life, than any previous one thousand years since the beginning of historical records. In no country upon the earth has the progress been greater than in our own, these United States of America, and in no one of these states has it been more marked than in our Minnesota.

My memory of horticulture covers a period of nearly seventy years. It began in the early years of the settlement of northern Ohio, and I have been an active and working votary of it down all the years since. My first love was the apple, the pioneer fruit and the first fruit that the hardy pioneers of the wilderness of the then far west attempted to cultivate, and, doubtless, I received inspiration from oft hearing the story of "Johnny Appleseed," who, with his mush pot and bag of apple seeds, made an annual tour through the gloomy regions of the farther west, dropping fruit germs in the forest, that grew and produced pippins for the vanguard of the foremost pioneers of Ohio's hills, valleys and plains. In those early years I had never seen, tasted or scarcely heard of a garden strawberry. No one dreamed of cultivating the brambles, or American species of raspberries and blackberries. The tomato, which today is a valuable article of commerce and considered an almost indespensible article of food, and of which millions of bushels are annually grown for canning purposes alone, was scarcely ever cultivated except as an ornamental plant and was by the masses of the people believed to be a dangerous and poisonous plant. The plums, pears and peaches numbered but a few and comparatively poor varieties, and of grapes we had only the native wildlings and the Isabella and Catawaba and a little later the sour Clinton, and these were cultivated by but few people and in a very small way.

The method of propagating trees by root-grafting was but little known, and previous to about sixty years ago the nurseries of America were chiefly seedlings, or seedling trees, budded or grafted above the ground. According to my recollection, I made my first root-grafts and put them in nursery in about 1840, using about six inches of root and three bud scions. The common price of a budded or grafted apple tree was twenty-five cents, and that compared with the cost of money at that time would be equal to fifty cents at the present time; while the cost of raising the trees was much greater than at the present time.

The great majority of the orchards were planted with natural seedlings, and after they began to bear fruit such as produced good or desirable fruit were retained and those that produced worthless

or undesirable fruit were top-grafted to that which was better. Today seedlings are rarely ever planted as orchard trees except by experimentalists who are seeking to originate new and better varieties. Nurseries were small affairs compared with the large commercial establishments of the present, where millions of trees are annually propagated by root-grafting, and the man who now plants an orchard may know to a certainty what manner of fruit it will bear. The method of root-grafting, as now practiced, I believe, was a discovery of the present century, although Evelys in a treatise on pomology, A. D. 1700, said: "Some there are who talk of removing the stock about Christmas and then also graft it; which there be that glory they can successfully do even by the fireside and so not be forced to expect a two or three year's rooting of the stock; but in this adventure 'tis advisable to plunge the graft three or four inches deep in the stock." That could not be done by the present system of piece root-grafting. At least, great progress in orcharding began in the general adoption of the practice of propagating trees by root-grafting.

The progress in small fruit culture began with the advent of the Hovey and Wilson strawberries, the Doolittle raspberry and the Concord grape. These all were prodigies in their day and generation, but most of them have since given way to hundreds of other varieties that are in many respects superior to them, and the cultivation and consumption of these grand fruits has increased a thousand fold within the memory of some of us who are here today. In those days the cultivation of raspberries and blackberries was unheard of, if not unthought of.

The progress of improvement in varieties and cultivation of vegetables and flowers and the ornamentation of rural homes, parks and cemeteries, has equaled, if not surpassed, that in fruit, and when we take a look back over the past we almost pity the lot of our fathers and grandfathers and wish that they could come back and enjoy the privileges of our day.

The progress in our country began in the work of those immortal heroes, the Downings, Wilder, Barry, Hooker, Hovey, Parsons and others who started the good work of improvement in American horticulture and from whom we have received our inspiration. And no little of this progress is due to the work of live horticultural societies and well conducted experiment stations and the multitude of books and papers that have been published and read within the last sixty years.

My experience and observations in Minnesota extend over a period of nearly forty-eight years, or since 1851. I planted apple trees in eastern Wisconsin in 1850 and in western Wisconsin, at La Crosse, in 1853, and in the spring of 1852 had a quantity of seed procured from Ohio planted about two miles north of La Crescent. My first orchard was planted on the place where I now reside in 1857, with seedlings of my own growing and grafted varieties from Rochester, N. Y. Since that date I have been intimately identified with the horticulture of the state. But little of the early history has been recorded, and it is a pity that it has not. It would afford many,

many chapters of great interest to us and to coming generations. I know that the horticulture of Minnesota was begun under great difficulties and caused some serious self denial among the early pioneers. Among these were families who had been reared in bright, beautiful homes that their fathers had reared in another wilderness' homes where the orchard and the garden had been their delight, and they availed themselves of the first opportunity to procure and plant trees in this new and untried region.

The first plantings were of the unadapted favorites of the east and south, and they had come a long and tedious journey from the distant nursery, much of the way by slow transportation compared with what we have at the present, and often the latter part of the distance in open wagons and exposed to the drying winds of April and May, and were finally planted in unprepared soil. Those that had not already yielded up the ghost of life made but a feeble and late growth and fell victims to some following test winter; and such as might have survived a few of our winters fell victims to mice and rabbits.

The beginning of the real settlement of southern Minnesota was in about 1851, and from that time on immigrants came in very rapidly and soon scattered out over the most easily accessible parts of the state. As there had been a settlement at St. Anthony Falls, St. Paul and contiguous country for some time previous, there may have been some fruit trees planted, but I have no evidence that previous to 1851 fruit had ever been cultivated in Minnesota subsequent to the period when it was the home of a pre-historic race.

The first settlement in Houston county was made at Brownsville, in 1848. As early as 1851 settlements were made along the Mississippi river, but largely by speculators who were seeking for town sites and steamboat landings. Prior to 1853 or 1854 the majority of settlers came up the river on steamboats; then great numbers began to come by the overland route, through Wisconsin, crossing the river on a ferry between La Crosse and La Crescent, and it was noticeable that many of them brought little bundles of trees, currant bushes shrubbery and even flowering plants in their well loaded "prairie schooners."

In 1852 or 1853, the first orchard in Houston county was started by Samuel McPhail, and at the same time he started a small nursery at Caledonia. About the same date a nursery was started at La Crescent, but did not prove a very great success, as it was located on a dry, gravelly bench, and after the trees had grown to a good planting size the most of them went by the "mouse and rabbit route." In 1852, one, John Shaw, brought to Winona county and planted on a claim at Minnesota City a nail keg full of apple seeds donated by his neighbors in Maine. He died the same season but willed that the little trees should be distributed to such neighbors as would care for them. They became the foundation of many fine orchards and greatly encouraged the planting of seed.

About 1853 or 1854 Peter M. Gideon planted an orchard at Excelsior and at the same time planted a bushel of apple seeds, but had very unsatisfactory results both with the trees and seeds, which had been procured from farther south. Later he procured seeds from

Maine and Vermont, and from them came the Wealthy apple, one of the most famous apples of the age.

During the following ten years, thousands of apple, pear and plum trees were planted annually, a number of small nurseries were started, and Minnesota began to be a good field for the operating of agents and dealers. This was before the days of "iron clad," "whole root," "budded trees," and "model orchard" swindles and other humbugs, and yet little progress was made, because the varieties planted were largely unadapted and the people had but an imperfect knowledge of a pomology that would apply to the region. The first really perceptible progress began soon after the organization of the state horticulural society, in October, 1866, with but twelve members. The membership roll of the society has now over 800, which is a good index of the progress made. At that time Minnesota horticulture was mostly an ideal thing, existing only in the busy brains of Col. D. A. Robertson, John H. Stevens, J. T. Grimes, L. M. Ford, Truman M. Smith, A. W. Sias, Chas. Hoag, R. L. Cotterell, Dr. J. D. Ford, I. W. Rollins, Wm. Somerville, Wyman Elliot and about a dozen others, including the writer, men who were beginning or dreaming of beginning in great earnest to plant nurseries, orchards and gardens and to ornament their homes with evergreens and shrubbery, and make suitable shelter for families and stock. Here and there, but far apart and of small area, were orchards beginning to fruit, and the fruit was fair and perfect. Here and there, one or two in a county, a farm home had become embowered in trees and shrubbery and protected against heat and storms, but in the main the farmers' homes were without adornment or shelter from trees of any kind, without flower or fruit garden, or there may have been the ghosts of a few dead apple trees to show that one unsuccessful effort had been made to have an orchard.

But now, my friends, we are able to record and point with pride to the amazing progress made in a little over a quarter of a century. Today our state is full of orchards, gardens and beautiful homes. Market gardening, then scarcely thought of, has become a great industry. There was not a nursery or fruit establishment in the state really worthy of the name, and now thousands of acres are devoted to the raising of fruits, fruit trees, plants and flowers, and there are enough trees and plants in our own nurseries to supply all our present needs, and yet this is the best canvassing ground for the foreign agent and tree peddler on the American continent. If our people would give their patronage to the home nurseries the progress would be still greater. The saving in cost would be at least fifty per cent. In many cases, like the "model orchard" and "wine grapes," the purchase is worse than money thrown away. Those who saw the the wonderful exhibition of fruits at the last state fair compared with the three small exhibits, in all less than twenty-five varieties, at the fair of 1866, can form at least a faint idea of the "progress in horticulture." We are getting to the front, we are creating a pomology of our own that will be just adapted to our wants. The coming fruit is the ideal one, and through the work of our state and local horticultural societies, the farm schools and experiment

stations, and the thousands of intelligent men, women and children who are encouraging the work by selecting and planting seeds, the ideal apple will soon be here, and millions of future generations will rejoice because of the fruits of our labors.

HARDY FRUITS FOR NORTHERN IOWA AND SOUTHERN MINNESOTA.

CHAS. F. GARDNER, OSAGE, IOWA.

(Southern Minnesota Horticultural Society.)

This is a question in which we all have the deepest interest and is a subject that requires the most careful consideration. One of the best authorities to which I call your attention is your state horticultural reports, which can be had each year on payment of the small sum of one dollar. I feel that a person has but little interest in the subject of growing fruits if he considers it too great a hardship to pay his dollar annually for your magnificent reports. It is true that the experiences as recorded sometimes appear conflicting to the casual reader, but when we consider the difference in environments, that can sometimes be noticed on farms situated within one mile of each other, the soil, the slope, the water line, the underlying strata beneath the surface, being essentially different, then it can be seen why there is a conflict in the reports on the growth and condition of the same plant under these circumstances.

There is still another way to account for these variations in the reports, where all the conditions spoken of, are apparently similar, except culture and management. One man may thoroughly prepare his ground in the autumn by first plowing shallow and then grinding this surface with the pulverizer and afterward plowing again to the depth of twelve to sixteen inches, and thus be able to catch and hold every drop of rain-water that falls thereon. This soaks down into the sub-soil and is brought up again when needed by capillary attraction. When spring comes the fruit trees and plants are set out, and the surface of the earth is kept covered with a dust blanket by frequent but shallow cultivation. This man will report success with given varieties, while the man who plows only once in the fall and shallow at that, or lets his ground alone until spring and then prepares it in the ordinary way, will if the season is dry report his efforts as more or less a failure.

A man who has interest enough in growing fruit trees to prepare his land the autumn previous as I have described will have the energy to wind the trunks of all trees with a piece of burlap, so that no tree will be girdled by rabbits; he will throw up a bank of earth around each tree to the height of a foot or more to protect from mice and also to protect the crown of the plant from the inclemences of winter; he will wash the trunks and large branches twice a year with strong soapsuds, thus preventing the attacks of the borers; he heads his trees low, so that as soon as possible the stem is shaded by its own foliage, and until this time arrives the burlap

I have mentioned is kept in place. This has been proved as effective as any of the contrivances made of lath and wire, costs less and is easily applied. This man reports success, the one who neglects these things reports failure.

What varieties of apples and other fruits shall we plant? In reply I would say, that if you want to be on the safe side and do not wish to enter on the line of experimental work, plant such varieties as are recommended by your state society and such kinds as you know are doing well in your locality.

The people of Austin are favored, in that they are at no great distance from two of the best experiment stations in your state, that of E. H. S. Dartt, of Owatonna, and Clarence Wedge, of Albert Lea, the efficient secretary of this society. Mr. Dartt, has eight hundred varieties of the apple grafted, besides a large number of ungrafted seedlings. Look up his reports and see what he says about them.

Last winter, while this society was in session at Albert Lea, a gang of agents were at work in the city and its suburbs taking orders for nursery stock, at prices three or four times as high as the same or better stock could have been procured for from the home nursery there. The said agents were from Illinois, and I am reliably informed that they sold several thousand dollars worth of stock in that vicinity. One thing is certain, they did not sell anything to a live, active member of your society.

It is an obvious fact that the class of men who bite at these baits offered by the aforesaid agents are those who do not read our horticultural reports, and they also belong to that class who are not patriotic enough to patronize their home institutions.

There are, no doubt, hundreds of seedling apple trees that have been produced during the past twelve or fifteen years that will in the future prove very valuable, and some of them, I have no doubt, will eclipse anything known.

At many of our experiment stations the work of cross-fertilization has been carried on to a very great extent, and crosses have been obtained of all our most valuable varieties, including the best of foreign sorts that have been imported from Russia and other countries. This work of hybridizing has produced crosses, the trees of which will, in my opinion, in the near future, produce results that will astonish the fruit growers of the northwest.

It is not to be expected that every one who attempts to grow fruit will be successful, any more than that all will succeed in any other business, still it must be admitted that the growing of the leading varieties of fruit offers as wide and safe a field for enterprise as is to be found in any other branch of business pertaining to the cultivation of the soil. Those who imagine that all that is required is to obtain the plants and see that they are planted, after which they can sit down and wait for a bountiful harvest, will be disappointed. That class of people, it matters not what they undertake, are sure to be unfortunate, and every experiment will end in failure until they learn to labor as well as to wait. Profitable fruit culture cannot result from idleness or negligence. Prompt, energetic action applied at the right time is essential to success.

ROOT-KILLING OF APPLE TREES.

Extracts from a bulletin with the above title just issued by the South Dakota Agricultural Experimental Station, and edited by Prof. N. E. Hansen, Brookings, S. D.

Dr. Regel was for many years director of the Imperial Botanic Gardens, at St. Petersburg. The following extracts from Regel's "Russian Dendrology" (Vol. IV., P. 269, St. Petersburg, 1874) was translated for me while in Russia in 1897, from Russian into German, by a translator at the St. Petersburg Botanic Gardens, and I have rendered this into English, as follows:

THE SIBERIAN APPLE TREE *(Pyrus baccata L.)*

The leaves are oval, tapering, flat, shining on the upper surface, light green, sharply toothed on the margin. The petioles are usually longer than one-half of the leaf surface. The fruits are borne on long, thin stalks, which are several times longer than the fruit, and are attached to the same in a depression on the base [cavity]. The calyx is cast off towards the time of ripening, through which characteristic *Pyrus baccata* is easily distinguished from *Pyrus prunifolia*, to which it is closely related.

Pyrus baccata flourishes throughout all Siberia into northern Japan, and on that account deserves consideration, because it is one of our best and hardiest trees for the garden. The large white or reddish blossoms are set on one-colored stalks arranged umbrella fashion. The calyx is externally flat, on the inside downy. The style is flat. *Pyrus baccata* is in full blossom the end of May and in June. The red cherry-like fruits of several of the varieties serve in the fall to beautify gardens and parks. The fruits of other varieties are used, when they have been touched by frost, for preserves; or, in spite of a certain acerbity, as a delicacy by the peasantry, as, for example, the fruit of *Pyrus prunifolia*.

Varieties are as follows:

1. *Genuina.* The fruits are nearly spherical, approximately of the size of a large currant; the ripe fruits are yellowish-purple. This variety is in its wild state the most widely distributed.

2. *Praecox.* The fruits are very small, the size of a common currant, dull purple when ripe, transparent after the first frosts. The flavor is milder.

3. *Oblonga.* The fruits are elongated oval, five-eighths inch in length and not much smaller in breadth; blood-red when ripe.

4. *Aurantiaca.* The fruits are roundish oblate (flattened), often ribbed. When ripe, orange colored, with dark, narrow stripes; five-eighths inch in length, three-quarters inch in breadth.

5. *Macrocarpa.* The fruits are roundish oblate, three-eighths inch in length and somewhat more in breadth. When ripe, yellow, with red on the sunny side.

6. *Cerasiformis.* The fruits resemble in size and form a moderate sized cherry; elliptical, ribbed, five-eighths inch in length and breadth. When ripe, yellow; later, scarlet red on the sunny side or over the entire surface. In fruit gardens this variety is known under the name "Chinese apple tree." The fruit is used chiefly for preserves. The tree presents a beautiful appearance in autumn.

7. *Conocarpa.* The fruits are conical, with a broad base tapering at the apex, five-eighths inch in length, ribbed, blood red when ripe.

8. *Edulis.* Very similar to the variety *cerasiformis*; the fruit however, is of a more pleasant flavor. It is the best variety for preserves.

9. *Costata.* Fruit oblate round, three-quarters inch in breadth, one-half inch in length, ribbed, blood red when ripe.

10. *Sanguinea.* Similar to the preceding variety; the fruits are, however, not ribbed.

11. *Lutea.* Fruits the same as that of variety *genuina*, but, when ripe, yellow with red cheek.

12. *Obconoidea.* The fruits have a narrow base, are obconical, ribbed, five-eighths inch in breadth. When ripe, orange yellow with red tracing.

PYRUS PRUNIFOLIA, WILLD.

A tree of medium size, which attains a height of up to thirty feet, and endures the severest frosts. The leaves are oval or broadly oval, obtusely pointed, serrate. The petiole is usually longer than half the leaf; when young the petiole, as well as the leaf, slightly pubescent, later quite smooth. The leaves are light green, yet not so shining as those of *Pyrus baccata.* The leaves are sharply saw-toothed, the serrations short and sharply pointed. The flowers are large, white, sometimes with reddish cast, borne in great numbers on the ends of the short side shoots. The one-colored slender flower stalks are united in close clusters. The inner side of the calyx and the lower part of the pistil are usually covered with white pubescence. The calyx segments are persistent in the basin of the ripe fruit; this characteristic distinguishes *Pyrus prunifolia* from *Pyrus baccata.* The slender fruit stems are longer than the ripe fruit, and are set in the depression on the base of the fruit (cavity). The flavor of the fruit is sour, somewhat bitter; there are, however, varieties with milder flavor. These varieties are in all cases the most resistant of our hardier Russian apple trees. *Pyrus prunifolia* is one of our trees with beautiful blossoms; at the end of May and the beginning of June this tree is covered with handsome white and reddish flowers. The form of the fruits is much varied; some of them are so beautiful that as they ripen in autumn the tree is decorated for the second time. These fruits are cherry shaped, from one-half to one and one-half inches long, and cover the tree in immense numbers.

The varieties are as follows:

1. *Suaveolens.* Large flowers, reddish externally, fragrant; on which account this tree is adapted for gardens.

2. *Microcarpa.* Fruits small, oval, red at maturity.

3. *Oviformis.* Fruits ovate, when ripe yellow with red tracing.

4. *Conocarpa.* Fruits conical, with oval base; when ripe, green with red on the sunny side.

5. *Intermedia.* The fruits are flattened-spherical, ribbed, yellow when ripe, blood red on the sunny side, seven-eighths inch in length, inch and one-eighth in breadth.

6. *Chlorocarpa.* Fruits either spherical or flattened-spherical; when ripe, green, with red on the sunny side.

7. *Xanthocarpa.* Fruits roundish-oval; when ripe, yellow; three-quarters inch in length, less in breadth.

8. *Calvillea.* Fruits oval or nearly spherical, ribbed, when ripe scarlet-red, about one inch in length and breadth. In autumn this variety is very handsome. The fruits are used for preserving; they are very similar to *P. baccata cerasifera*, but are distinguished by the fact that the calyx segments do not fall off from the ripe fruit.

Synonym: *P. cerasifera*, Tausich var. *calvillea.*

9. *Macrocarpa.* The fruits are one inch in length and breadth, nearly spherical, ribbed; when ripe, green.

10. *Striata.* Fruits oval, one inch in length; when ripe, yellow with dark red stripes.

Pyrus prunifolia flourishes in southeastern Russia and in southern Siberia. It is propagated from seed. The varieties preserve their characteristics only when grafted.

Very similar is *Pyrus spectabilis* Ait., from China; this grows, however, usually in bush form and is covered every year with abundant reddish blossoms.

Pyrus kaido, P. ringo and *P. armeniacifolia* are garden varieties; they are not resistant to our winters.

The full history of *Pyrus baccata* and *Pyrus prunifolia* in a state of nature and under cultivation is yet to be written. Since their introduction into America they have been grown in mixed orchards, especially in the western states, and very many hybrids with the cultivated apples have originated under cultivation. Many of these are too much subject to blight to be of value, while others are regarded as very valuable, especially in the prairie northwest, owing to hardiness and productiveness.

The true *Pyrus baccata* has been neglected, owing to small size of fruit and ignorance of its value as a hardy stock. As to the original home of these two species, Dippel gives eastern Siberia, China and the Himalayas as the native home of *Pyrus baccata*, and China and Japan (p. 398) as that of *Pyrus prunifolia.* Fr. Th. Koeppen in discussing the indigenous distribution in Russia of *Pyrus malus* concludes as follows: (page 417). "Finally in this connection should be named *Malus (Pyrus) prunifolia* Willd., which form, according to Regel, is said to grow in southeastern Russia (?) and in southern Russia. Meanwhile from the whole Russian empire I find not a single certain locality where it has been found (Fundortsangabe). Ledebour gives only Siberia (and this with a question mark) as the native habitat of this form."

Prof. L. H. Bailey refers crabs of the Transcendent and Hyslop type to *P. prunifolia Willd.*, and considers them hybrids of the common apple and *Pyrus baccata.* After a visit to Berlin Prof. Bailey writes: "Willdenow's type of *P. prunifolia*, preserved in Berlin, shows flowers and leaves and has the botanical characters of the Transcendent and Hyslop crabs. It is almost unmistakably a hybrid of *Pyrus malus* and *P. baccata.*

Koehne gives Siberia and north China as the habitat of *P. prunifolia*, and the Himalayas, China, Amur province and Siberia as that of *P. baccata*. Dr. Regel, as has been noted, makes the deciduous calyx segments the distinguishing characteristic of *Pyrus baccata*. This characteristic is also emphasized by Dippel and Koehne. Koehne mentions *P. prunifolia* as having taken part in the evolution of our cultivated apples. Koehne and Dippel both use the older generic name *Malus* instead of *Pyrus*. Dippel gives *P. baccata odorata* with fragrant blossoms as being probably a hybrid; Koehne considers this to be a hybrid of *baccata* and *prunifolia* (*"M. baccata X prunifolia"*) and states there are many such hybrids which for the most part can not be determined without the fruit. The *odorata* variety noted as hardy at Brookings was imported from the nursery of L. Spaeth, of Baumschulenweg, near Berlin, where Koehne made many of his observations.

Dr. Schroeder of Moscow, Russia, told me of having had good results with *Pyrus prunifolia* as a stock, but outside of Moscow I heard only of *P. baccata*.

APPLE SEEDLINGS FOR STOCKS.

The following article "Apple Seedlings for Stocks," was translated from Russian from a work on "Commercial Horticulture," by Alexander Kondratevitch Grell (Moscow, 1897).

"Among the seedlings which are used for stocks, I give the preference above all to the Siberian 'berry apple' (crab). There are two varieties of this species which are both used for the propagation of seedlings, viz: *Pyrus baccata var. cerasiformis aurea* and *Pyrus baccata var. cerasiformis rubra*.

"The Siberian apple tree, which is known in gardens under the erroneous name 'Chinese apple tree,' grows wild in southwest Siberia and northeast China, bears small round fruits, which are golden yellow in the first named variety and reddish in the second named variety. To this I count also a third species, useful in the highest degree but as yet but little distributed among us, viz: *Pyrus prunifolia var. macrocarpa*. Both of these species and their varieties are very pretty small trees, which are laden every year with innumerable yellow or red fruits and give an extremely heavy crop of small seeds. The seedlings of the Siberian apple do not form so thick stems as those of the cultivated apple. When one grafts any desired garden variety on a Siberian crab, the stem below the point of union always remains thinner than above the same, hence an outgrowth arises at that place. When, on the contrary, the Siberian crab is grafted on a garden variety, the reverse condition arises, i. e., the stem beneath the point of union becomes thicker than above. The local peasant nurserymen, who are familiar with these characteristics, grow the Siberian crab for sale for stocks on forest or garden varieties.*

"The Siberian crabs propagated in this manner grow faster than those grown from seed. Aside from the fact that the varieties grafted on a Siberian crab form neither too thick a stem nor a too

*By this is meant *Pyrus malus*, which grows wild in parts of Russia.

thickly branchedtop, I give to the Siberian crab seedling, above all, the preference, and for two reasons: (1)Varieties grafted or budded on the Siberian crab bear much more and earlier fruit and (2) suffer much less from frosts. In a severe winter in the Borokow district, in the Kaluga province, all varieties of the apple were killed with the exception of a few which had been grafted on *Pyrus prunifolia macrocarpa*. Only these few escaped without injury. Since that time this species has been known only as the "unconquerable" in the Borokow district and in Wereja.

"Hence it is not at all necessary to search for other wildings for stocks, since there are present for us in *Pyrus prunifolia macrocarpa* characteristics of such immense valne. Some say that varieties grafted on the Siberian crab are not long lived, but this assertion is wholly without foundation, since a tree of *Pyrus baccata genuina* planted by me in Moscow, in 1859, is still growing and bearing fruit, and at M. F. Essen's is found one that has already reached its fiftieth year. Next after the Siberian crab, in hardiness and longevity, comes the forest apple, wilding, and after that comes the seedlings of garden varieties.

"The fruit of the Siberian crab is used for sauce, preserves, etc., and the seeds for the raising of new,improved seedlings. After the ripe fruit has been gathered, the cores must be removed. This is done quite easily. Take a narrow thin strip of tin, sharpen one edge and wrap it around a round, slender lead pencil. The instrument is ready, and by pressing this small tube through the middle of the fruit, the whole core is removed and the flesh is left to be used for sauce, preserves, etc. A very good seedling for stocks is also *Pyrus malus*, which is found distributed far to the north. The seedlings of garden varieties are far inferior to the above named varieties. From six poods (equals 216 lbs. avoirdupois) of garden varieties, one obtains only one pound of good large seeds, while from the same quantity of *Pyrus baccata cerasiformis* one obtains ten times; from *Pyrus prunifolia macrocarpa*, six to eight times, and from *Pyrus baccata genuina* one hundred times as many seeds, only that they are very small."

EARLY EXPERIMENTS IN WISCONSIN, IOWA AND MINNESOTA.

Experience in many orchards in the northwest shows that the cultivated apple makes a poor union, as a rule, in top-grafting upon the Siberian crab. In most cases the top overgrows the stock. Some strong-growing varieties have kept pace with the apple top in growth, and are regarded as valuable for stocks. Earlier bearing and shorter life seems to be the effect upon many varieties when top-grafted upon Siberian crabs. A full investigation of these numerous experiments should be made. It would necessitate considerable traveling.

Piece-root grafting on Siberian crab seedling roots has been tried quite extensively, and the general experience is unfavorable. The early volumes of the annual reports of the Wisconsin, Iowa and Minnesota state horticultural societies contain a number of reports

of unfavorable experience along this line. The Iowa reports also quote unfavorable Vermont experience.*

In the reports the term "Siberian crab" is used in nearly all cases, no distinction being made between *P. baccata* and *P. prunifolia*. The inference, however, may be made that they were chiefly of the *prunifolia* type, the true *P. baccata* being rare in cultivation, owing to the small size of the fruit. So far as the writer has been able to ascertain, the Russian method of budding at the collar on seedlings of *Pyrus baccata* already established in the nursery has not been fully, if at all, tested. The chief objection to the trees root-grafted on Siberian crabs appears to be the dwarfed growth of the tree. The only reference to budding, in the reports at hand, is by E. Wilcox, of La Crosse, Wis., in the Wisconsin horticultural report for 1881-2, p. 36. Mr. Wilcox "budded a portion of his stock and thought the union was stronger and more perfect than where grafted." Mr. Wilcox expressed strong preference for the use of the Siberian crabs for stocks.

Budding may do better than root-grafting. A parallel case may be found in the case of the Mahaleb cherry. Cultivated cherries bud very readily on this stock, but unite with great difficulty in root-grafting.

The Russian method of budding on *Pyrus baccata* stocks, if found to be a good method in the prairie northwest, will do away entirely with root-grafting in the winter, and make the trees somewhat more expensive. The dwarfing effect of this stock, already referred to in the citations from Russian experience, may not prove a disadvantage for the home orchards of the prairie northwest, since on our rich prairie soils apple trees are prone to form wood instead of bearing fruit. Many varieties, otherwise valuable, suffer in public estimation because of their tardy bearing. This shy bearing has caused much interest of late years in girdling experiments. Mr. E. H. S. Dartt, of Owatonna, Minnesota, has already obtained some valuable results from his girdling experiments. Any dwarf stock tends to cause earlier bearing; it is in effect a mild form of girdling, the partial stoppage of sap at the point of union tending to force the sap to form fruit buds rather than wood buds.

In all sections where root-killing is not a source of constant trouble, the dwarfing tendency of the *Pyrus baccata* stock will probably be a fatal objection, at least for commercial orchards. The climatic conditions of the native home of this crab also lead to the opinion that it will be at home only at the north. In like manner, in Russia the writer found the stock used only at the north, while at Kieve, where French pears are grown, seedlings of the cultivated apple *(Pyrus Malus)* were used.

BUDDING VS. PIECE-ROOT GRAFTING.

In the nurseries of Europe piece-root grafting in winter is not practiced, budding in August at the collar on seedlings already

* Wisconsin State Horticultural Society report: 1870-71 (referred to in later reports); 1879-80, p. 259; 1880-81, p. 190; 1881-82, p. 34-38; 1890, p. 115; 1892, p. 67.

Iowa State Horticultural Society report: 1873, p. 81; 1875, p. 153; 1875, p. 260; 1876, p. 224; 1876, p. 250; 1877, p. 386; 1884, p. 231.

established in nursery being the accepted method. Grafting at the collar in spring is used where the bud has failed. These two methods are the only ones that give the strong, straight-stemmed trees demanded by their trade. The apple trees noted by the writer in 1894 in visiting many nurseries and schools of horticulture in a four months' trip through England, Germany, Denmark, Sweden, Russia, Austria, Belgium and France were all propagated in this manner, except those in northern Russia, and impressed me with their smooth, healthy and vigorous growth. A two-year budded tree averaged fully as large as a three year old piece-root grafted tree in our western nurseries, and were superior in smoothness of stem and freedom from an undue number of pruning scars.

Indeed, our American nurserymen in the eastern states have long practiced the budding of apple trees, the same as in European nurseries, as they find it gives a larger percentage of salable trees. Western apple seedling growers meet this eastern demand for seedlings with branched roots by sorting these out (called "budders" in nursery parlance). These "one year No. 1 seedlings, 3-16 inch and up at the collar," with branched roots, are worth as much wholesale as those with long, straight unbranched roots, of the same caliber at the collar, which are used for piece-root grafting. In European nurseries the branched roots are obtained either by crowding the seedlings in seed bed the first year and transplanting with trimmed roots the second year, or more commonly by transplanting the seedling the first year when quite small. The latter method is called "pikiren" by German growers, and is practiced extensively in French and German nurseries. This transplanting (and not pinching) breaks up the tap root and causes it to branch.

The budded trees of eastern nurseries have failed in the northwest because of the seedling root being too near the surface. Northwestern nurserymen have found piece-root grafts far better, because by using a long scion and short root the tender seedling is brought several inches deeper below the surface, and the scion has an opportunity to form its own roots. "Whole-root grafted trees" are exposed to the same danger as budded trees, the tender seedling being brought too near the surface. If made with as long a scion as the piece-root grafted trees, the seedling root has the same chance of protection by the earth covering, and the scion roots have the same opportunity to form roots. But this is not usually done, as it would make the root-graft too long for convenient planting in the nursery. But last winter's experience at Brookings demonstrates that the scion roots of hardy varieties of the cultivated apple are tender as well as the seedling roots, so that hardier stocks are necessary on the northern borders of orcharding in the prairie Northwest.

The latest reference on the subject we find as this bulletin goes to press. Geo. J. Kellogg of Janesville, Wis., writes in Wisconsin Agriculturist, September 7, 1899:

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*Iowa State Horticultural Society report 1894, p. 149; 1895, p. 453.
Minnesota State Horticultural Society report 1896, p. 493.

"After last winter's experience, we need a root for the apple as hardy as the crab root, and, while I fully believe in using crab seed for stock, the trials made thirty years ago on such stock tended to dwarf the trees and bring them into earlier bearing, owing to lack of vigor and push. Such stocks are certainly more hardy in the root, and if we can secure Virginia crab seed I think they will make the best stocks we can get . . . ."

At Brookings we find Virginia crab, standing next to Transcendent in the old station orchard, planted in 1888, blighting badly the past two years; the foliage, also, is subject to scab. This variety has not blighted in the young station orchard, planted in 1896, with no Transcendent near, and these young trees proved hardy the past winter.

THE PROBLEM BEFORE US.

It now remains to be settled by experiment which is the best form, if any, of the Siberian crab to use for stocks. Judging from the foregoing notes and from numerous enquiries made while in Russia, the writer is inclined to consider *Pyrus baccata* as the best for our use. It is the hardiest known species of the apple, and the influence of hybridity will not come in as a disturbing factor in ascertaining results. Seed from Siberia is not yet obtainable in commercial quantities, but with the opening of the new Siberian railway this difficulty will soon be obviated. Just east of Lake Baikal, *Pyrus baccata* is said to occur in such abundance that a certain range of mountains is called "Apple Mountains." The writer is endeavoring at present to obtain more seed from this region.

The Transcendent and Hyslop crabs blight so badly at Brookings as to be worthless. The old Yellow or Red Siberian, with fruit the size of a cherry, or less, may prove very useful, also the old Cherry crab. Old trees, forty years old or more, are found scattered through the older parts of the west, and at present are neglected because of small size of fruit. The seed of all crabs with deciduous calyx, such as the old Yellow Siberian, should be saved. Mr. Gideon's plan should also be carefully tested of saving seed from hardy hybrid Siberian crabs.

As a matter of fact, it appears that the question of hardier stocks has not forced itself upon public notice save after unusually severe winters, where much loss was experienced from root-killing. In ordinary seasons it was found that the common apple seedlings were more readily obtainable in commercial quantities, and the losses from root-killing passed gradually from memory. Had the "test winters" occurred every winter, it is probable that the crab stock question would have received more general attention. For the northern part of South Dakota the liability to root-killing is greater than in regions in the same latitude with greater snowfall further east, and the need of a hardy stock becomes more manifest. It is the purpose of this bulletin to call attention to the matter, and to stimulate exact experimentation along this line, rather than to make positive recommendations.

The stocks for a fair test should be handled much like the Mahaleb or Mazzard stocks for the cherry in the eastern nurseries, setting the stocks in nursery first, and afterwards, when established, budding the cultivated apples upon them.

It will take many experiments to fully settle the question. Let all who can try a few and report results. In the meantime, we strongly advise watering trees if possible before the ground freezes in the fall, and then applying a heavy mulch also before the ground freezes, to prevent too severe freezing of the roots.

SUMMARY.

1. By the word "stock," nurserymen mean the tree or root upon which a tree is grafted or budded.

2. The ordinary American and French apple seedlings (*Pyrus malus*), now used as stocks for the cultivated apple, are not sufficiently hardy over a large part of the prairie northwest in severe winters. This causes root-killing, and the hardy top, thus left without a root to support it, necessarily perishes.

3. The American wild crab (*Pyrus ioensis*), as found native at Des Moines, Iowa, winter-killed at this station, and hence is not sufficiently hardy to use as a stock. It has not been found native in South Dakota, save in the southeastern corner.

4. The experiments at this station show that the roots thrown out from the scion in root-grafts of the hardy varieties of the cultivated apple are hardy in ordinary winters, but did not prove hardy the past severe winter (1898-'99), minimum temperature forty degrees below zero Fahrenheit with the ground bare.

5. Limited experience with seedlings of hardy varieties of the cultivated apple at this station indicates that they will not be exempt from root-killing in winters like that of 1898-'99. Seedlings of the wild apple from the province of Kursk, southern Russia, also proved subject to root-killing.

6. Top-grafting on Siberian crabs has not proved generally successful. Piece-root grafting on Siberian crab seedlings has not proved successful, as tried by a number of northwestern nurserymen.

7. The commercial methods of propagating apple trees in American and European nurseries are described. In the nurseries of Europe and the eastern United States, budding upon seedlings previously planted in the nursery is preferred to piece-root grafting in winter. In the western nurseries piece-root grafting with a long scion and short root is the better method, as it puts the tender seedling root further beneath the surface.

8. The true Siberian crab (*Pyrus baccata*) is the hardiest known species of the apple, and if it proves sufficiently exempt from blight may prove of great value as a stock in sections where root-killing is a source of trouble. Young plants of this species proved perfectly hardy the past winter on the grounds of this station.

9. Translations from Russian authorities are given to aid in distinguishing *Pyrus baccata* from other closely related crabs.

10. A root-graft of *Pyrus baccata odorata* upon the station grounds lost the American seedling root by winter-killing, but the tree was saved by the root thrown out by the scion, which proved hardy.

11. The Russian method of preventing root-killing by using the true Siberian crab (*Pyrus baccata*) as a stock is described. The Russian experience with this species as a stock is that it causes earlier bearing, but dwarfs the tree somewhat in growth. In sections where root-killing is a source of frequent trouble this Russian method deserves a trial.

12. Until the question of hardy stocks is settled, trees should be well mulched every fall before the ground freezes, to prevent too deep freezing of the roots and consequent winter-killing.

THE ROOT-KILLING OF NURSERY STOCK.

PROF. E. S. GOFF, WIS. AGR. EXP. STATION.

(From Wisconsin Horticulturist.)

The effects of the past winter upon nursery stock in the northwest are already too familiar to many of us. Stating the results in brief, —where the ground was bare of snow at the time of the severe freeze, and this includes a tract of country covering several thousands of square miles, one, two and three-year-old fruit trees are more or less root-killed; in many cases, the loss is complete. The damage has not been confined to the nurserymen, and it will not stop with the nurserymen, for much injured stock has doubtless been planted by would-be fruit growers. The damages have not, as a rule, shown much respect for varieties. Exposure, soil or other unknown conditions seem generally to have been more potent. Trees growing on sod have probably escaped more often than those on cultivated ground, and those in poorly cultivated nurseries have often fared better than those in well cultivated ones, but in many cases of apparent equal exposure, certain trees have been taken and others left.

I can, of course, say nothing at this time to mitigate the losses that have already taken place, but a somewhat thorough investigation has revealed some facts that may be valuable as a guide to the future. It is true that the blizzard has left in its train a host of anomalies that cannot be explained by any experience or precedent. Many varieties and species that have heretofore been considered not fully hardy have passed the ordeal with less damage than others that have been considered iron-clad. But amid much confusing testimony, a few principles seem to be brought out that it is worth our while to consider.

1. The widespread destruction of roots brings home very forcibly a fact that has been too often overlooked, viz., that in the breeding of hardy fruit trees we have two distinct problems in hand, i. e., to produce a hardy top and a hardy root to support it. Neither is safe without the other. We have been trusting to nature to protect the roots by snow, but the past winter is a most effectual reminder that this protection is not to be depended upon. We have said much

about our ironclad apples, forgetting that, like the Merrimac in Rebellion days, our armor plates reached only to the ground line. The little Yankee Monitor, at an opportune moment, was able to slip in a lucky shot through the unprotected planking of the Merrimac, and thus to decide the fate of Rebellion and of slavery. Jack Frost has acted the part of the Monitor the past winter, and, as the result, many of our nurseries have suffered the fate of the Merrimac. The moral is clear enough, however difficult it may be to carry out, and it throws a vast responsibility upon our experiment stations.

The roots of the crab apple are hardier than those of the common apple. Had apple stocks generally been grown on crab seedlings instead of common apple seedlings, the damage from root-killing would probably have been greatly reduced. Would not seedlings grown from various kinds of crabs, like the Virginia, be preferable for root or crown grafting to those of the common apple? The seeds could not, of course, be obtained so cheaply at the present time, but the crabs are very prolific, and nurserymen could easily grow their own seed. By growing the Virginia crab from seed, in isolated groups, it would in a few generations, at most, come near enough true from seed for all purposes of grafting. If it can be shown that trees thus grown are better able to endure winters like the past, the demand for the trees would doubtless soon create a supply of the seed. In like manner, we should experiment with the sand cherry and the wild red cherry as stocks for the cherry, and we should confine the plum to Americana stocks.

2. It is dangerous to leave the ground of the nursery bare during winter. Several correspondents have stated that nurseries and young orchards that had been allowed to grow up to weeds last autumn suffered less from root-killing than those that were cultivated. This means that the nursery should have a cover crop during winter, and this, in turn, encourages damage from mice. We can easily secure the cover crop by sowing oats about the middle of August, and the mice could probably be prevented by sowing corn soaked in a solution of strychnine, at the commencement of winter.

3. All means should be used to cause snow to remain upon the ground of the nursery during winter. If half of the snow that actually fell up to February the past winter, in southern Wisconsin, could have been retained, it would probably have been enough to save our nurseries. Planting fruit stock on north slopes that are traversed east and west by frequent evergreen windbreaks would go far toward accomplishing this end. A cover crop on the ground would still further encourage the snow to remain

4. The superior hardiness of the raspberry as compared with the blackberry has been strikingly brought out in a multitude of cases. Many have reported almost total destruction of the blackberry, while the raspberry was comparatively little injured. The Loudon raspberry among reds and the Older among blacks have established their claims for remarkable hardiness, and if we might judge from the past winter only, there would seem little necessity for giving these varieties protection in the northwest. Indeed the importance of protection for the rubus fruits has suffered a serious

blow the past winter, for many unprotected plantations escaped with as little harm as others that were well protected. There is a great danger that this unique example will be wrongly interpreted, and that many will make it an excuse for omiting protection in the future. But we should remember that it is not the severe cold that is usually most damaging to the canes of the rubus fruits, but rather the alternate freezing and thawing to which they are exposed in comparatively mild weather. It is the experience of many extensive Wisconsin growers that it pays to protect the raspberry and blackberry, even in comparatively mild winters.

Should root-injured trees be sold? This is a practical question, and one which, it seems to me, admits of an easy answer. The injury generally proceeds from the tips of the roots backward. If only the fibrous roots are killed, the trees may be transplanted with as much safety as if no injury had occurred, for the fibrous roots are mostly sacrificed in transplanting by our present systems. It would be better for the tree if the fibrous root could be saved, for the roots, if in a healthy condition, should be alive to the tips. But I do not know that it is much worse to have the smaller roots frozen off, than to have them cut off with the spade or digging machine. I think as much harm may result from digging healthy roots after they have commenced growth in spring, as from a moderate amount of damage by freezing in the soil. But trees that show damaged roots after they are dug should certainly not be sold as sound stock.

What of the future? Shall those of our nurserymen that find themselves cleaned out of fruit stock continue to plant? I spent some hours looking over a nursery in southern Wisconsin with the proprietor, and after seeking in vain for a single fruit tree that had a live root, he surprised me by saying, "I believe that this spring is the time to plant heavily of nursery stock." While I was surprised, I think he was quite right. The demand for nursery stock has not been root-killed, and winters like the past are certainly not coming every year, though they are liable to come any year. We should profit as much as possible by the experience and be better prepared for it next time. Root-killing is probably not so rare an occurrence as some suppose. Probably more or less of it occurs every winter when the ground is bare for any considerable time, but so long as it affects only the fibrous roots it is often unobserved. Many nurserymen suppose that the death of the fibrous roots in winter is an annual occurrence, but this is probably an error. In the spring of 1898, after a remarkably mild winter for Wisconsin, I examined the roots of nearly all of the trees and shrubs commonly grown in the nurseries of our state and failed to find a single instance in which any large part of the root-tips were dead. The spring just past, I again examined the roots of many of the same species, and found that in only a few of them did the root growth start from the tips. Indeed, the only case found of a fruit tree that started growth from the tip was a single specimen of the Whitney crab. Several roots of the Virginia crab were found to have started growth very close to the tip, but in no case examined were the root

tips alive. In the very hardiest species, however, as the box elder, the hard maple and the elm, the root tips were alive. I should add however, that in certain cases individual specimens of almost all trees have been root-killed at Madison the past winter.

SUBSOILING FOR TREES.

E. A. MORRIS.

(In "Dakota Farmer.")

In June, 1884, I broke a five acre tract for trees seven inches deep using four heavy horses on a breaking plow. This was thoroughly pulverized and sown to turnips July 3d. A crop of turnips amounting to many hundreds of bushels was grown and fed to cattle, hogs and sheep.

The following June this tract was again plowed "beam deep" (subsoiled), using four heavy horses on single 16-inch walking plow. After plowing, it was thoroughly harrowed and kept in the best condition during the summer and autumn by harrowing from three to five days after each shower of rain to prevent evaporation. Here lies a secret to many, but a well known fact to the progressive western farmer, which, when generally understood and practiced will do more for the South Dakota farmer than even the ablest tiller of the soil has dreamed of. He who thus prepares his fields builds a reservoir capable of storing up nature's supply of rainfall in sufficient quantities to grow an abundant crop during a more severe drouth than has visited this country since I became a resident of South Dakota fourteen years ago.

When land is thus plowed and the surface kept thoroughly fine on the surface, the reservoir is quickly filled and the moisture retained or conserved to be utilized by plant growth. The following spring this five acre tract was planted to cottonwood cuttings as for plantations. Prior to planting, the cuttings were tied in bundles of 200 each and placed in a pond of water and remained there for three weeks, until the wood was thoroughly saturated and buds began to start, then planted deep in the soil, leaving but an inch above the surface. Again the harrow was used without damage to the cuttings, thus keeping the soil in the best possible condition and reducing evaporation to the minimum point.

For three years following, these trees received thorough cultivation from six to eight times each season, the last year it being necessary to pad the neck-yoke and axle of cultivator with sacks stuffed with hay to prevent injuring them. The growth of these trees has been remarkable and practically all are alive and thrifty today.

The plantation was seeded to clover and timothy when last cultivated, then fenced and since used as a hog pasture, furnishing an abundance of feed and the dense foliage almost a perfect shade and the natural home of the greatest of America's mortgage lifters, the well bred hog.

PROPAGATION AND CARE OF HOME-GROWN FRUITS.

MISS MINNIE ROWE, MINN. SCHOOL OF AGRICULTURE.

That the importance of raising small fruits is overlooked by farmers generally was brought to my notice recently when visiting a friend living in a small town in South Dakota. The farms in the vicinity were from 320 to 1,000 acres in extent. This friend had seen no berries of any kind, although they were in season. The dealers were afraid to order them because of their perishable nature. One dealer at length had the courage to order a case of blackberries, one-half of which was purchased by a lady whose husband was the owner of of 600 acres.

The greatest value to be derived from fruit raising is the supply which every occupant of the land may have at his own door, and its source of economy, comfort and health. Nature demands that we have a varied diet, and that she has made ample provision for this in one respect is proved by the quantity and variety of wild fruits.

Strawberries, gooseberries, raspberries, grapes and blackberries are so easily grown and yield such excellent returns for a small outlay of time and money that one wonders why they are not more generally cultivated.

Currants will thrive almost anywhere, and with a little attention an abundance of this luscious fruit may be produced. Cuttings may be made, seven to twelve inches long, in August, from the new growth. These are set out in rich soil, four or five inches apart, in rows three feet apart. One inch of the cutting should be left above ground, and the soil firmly packed about the bottom of the cuttings. They will root before the ground freezes and start growing early the next spring. Cultivate as for corn, and the second spring they will be ready for transplanting to a permanent location. Set the bushes about five feet apart each way in rows, and cultivate thoroughly the first season. The second season cultivate until the latter part of June, when the bushes may be mulched and will require little attention besides pruning and an occasional mulching. The best time to prune is after the fruit has been picked and the leaves have fallen. The greatest amount of fruit is formed on wood of the third season's growth, consequently not much pruning is necessary the first three years besides pinching out the young shoots, as the fruit will be small if too many are allowed to grow.

As far as personal experience goes, the currant seems to be the least infested by insects of any fruit. During fourteen years we have had little or no trouble with insects.

With us, the Red Dutch has proved to be the hardiest and most productive of the red varieties, and the White Grape of the white varieties.

Gooseberries are closely related to the currant and may be grown under the same conditions and in the same manner except as regards propagation. The branches may be laid down in June, covered with earth, and they will be rooted by fall, when they may be cut off and planted out. If left until spring, transplant early, as they start growing quickly. Mildew is the worst enemy. The ber-

ries become covered with this whitish mould, and the flavor is ruined. The old proverb applies here, that "an ounce of prevention is worth a pound of cure." The treatment should be preventative by giving the bushes plenty of room. It is better not to plant gooseberries with other bushes, as they prevent free circulation of air, which is all important. Thorough cultivation will assist in keeping the bushes in a healthy condition. There are several hardy varieties. "Industry" has proved satisfactory during the past three years with us.

Raspberries are easily propagated by layering and root cuttings. The red varieties send up shoots from the roots, and these with a moderate amount of roots may be transplanted. This may be done in the fall or spring. The land should be rich and thoroughly cultivated. Set the plants three feet apart in rows six feet apart. Keep the weeds down by thorough cultivation and allow no more than four or five shoots to grow. The second season these will produce fruit, and should then be cut out as soon as the fruit has been gathered, and the new shoots, which will fruit the next season, thinned out. Remove all other shoots by pinching them off.

The blackcap raspberries are propagated by layering, which is done in August by laying the ends of the branches on the ground and covering with several shovelfuls of earth; they will root before cold weather comes on. In the spring cut off a piece of cane with the roots, transplant and cultivate as with the red variety.

In most sections of the state, winter protection is necessary, which may be given by laying down the canes. Gather the canes together and bend towards the ground, at the same time pressing with the foot at the base of the canes. Cover the tips with a shovelful of earth to keep them down. Lay all the canes down in this manner, in a row. With a wide plow turn a furrow on each side, throwing the dirt over the canes.

Methods of cultivating other fruits will readily suggest themselves, and when an interest is aroused, farmers will arrive at the conclusion that the cultivation of fruit is as important as that of wheat.

We are reminded of the story of the farmer that owned a large farm and didn't devote any of it to fruit, who once upon a time took tea at a neighbor's. He asked for a second dish of berries and declared with the same breath that fruit raising did not pay.

"Precept is better than example."

"The proof of the pudding is in the eating."

The process of orchard cultivation is not difficult. Tools used may be disk harrow, spring tooth harrow, or any of the implements found on almost any farm. If the spring is dry, plow with an ordinary breaking plow, then go over the ground with a disk harrow. For later cultivation a spring tooth harrow is probably the most desirable. Carry cultivation as near the trunk of the tree as possible. Care must be exercised in working under overhanging tops, as much damage may be done the fruit. After heavy rains the surface should be broken up with a smoothing harrow. If the rains have been very heavy it may be necessary to use a disk for this purpose. In seasons where rainfall is abundant it will be sufficient to keep the orchard free from weeds.

A "BIRD DAY" FOR SCHOOLS.

The Department of Agriculture, through the efforts of C. A. Babcock, of Oil City, Pa., has conceived the idea of establishing "Bird Day" in the schools of the United States, to be observed in the same manner, as far as possible, as "Flag Day," and "Arbor Day." It is believed that a general observance of such a day in the schools of the United States would have the effect of increasing the knowledge of and consequently the love for the American song birds, from which might be expected to result a general disposition to foster their propagation and punish those who kill them. In furtherance of this plan the department has issued the following circular:

"From all sides come reports of a decrease in native birds due to the clearing of the forests, draining of the swamps and cultivation of the land, but especially to the increasing slaughter of birds of game, the demand for feathers to supply the millinery trade, and the breaking up of the nests to gratify the egg-collecting proclivities of small boys. An attempt has been made to restrict these latter causes by legislation. Nearly every state and territory has passed game laws, and several states have statutes protecting insectivorous birds. Such laws are frequently changed and cannot be expected to accomplish much unless supported by popular sentiment in favor of bird protection. This object can only be attained by demonstrating to the people the value of birds—and how can it be accomplished better than through the medium of the schools?

"Briefly stated, the object of Bird Day is to diffuse knowledge concerning our native birds and to arouse a more general interest in bird protection. As such it should appeal not only to ornithologists, sportsmen and farmers, who have a practical interest in the preservation of birds, but also the general public, who would soon appreciate the loss if the common songsters were exterminated.

"It has been estimated recently that the forests and streams of Maine are worth more than its agricultural resources. If this is so, is it not equally as important to teach the best means of preserving the timber, the game and the fish, as it is to teach the student how to develop the agricultural wealth of the state? In 1885 Pennsylvania passed its famous 'scalp act,' and in less than two years expended between $75,000 and $100,000 in an attempt to rid the state of animals and birds supposed to be injurious. A large part of the money was spent for killing hawks and owls, most of which were afterwards shown to be actually beneficial. Not only was money thrown away in a useless war against noxious animals, but the state actually paid for the destruction of birds of inestimate value to its farmers. During the last five or six years two states have been engaged in an unsuccessful attempt to exterminate English sparrows by paying bounties for their heads. Michigan and Illonois have each spent more than $50,000, but, although millions of sparrows have been killed, the decrease in numbers is hardly preceptible. A more general knowledge of the habits of the English sparrow at the time the bird was first introduced into the United States would not only have saved this outlay of over $100,000, but would also have save many other states from loss due to depredations by sparrows."

PROGRAM

OF THE

Thity-third Annual Meeting of the

Minnesota State Horticultural Society.

To be held in the offices of the County Commissioners in the Court-House at Minneapolis, Minn., Tuesday, Wednesday, Thursday and Friday, December 5, 6, 7 and 8, 1899. Ladies are especially invited. Send or bring questions for Question Box.

ANNOUNCEMENT.

The meeting will be held this year in the same rooms—those of the County Commissioners in the Court-House—as last year. The two smaller connecting rooms will be used for the fruit exhibit, and another room adjoining will be used for a cloak room, where garments, etc., will be checked and cared for free of charge to those attending. To reach these rooms from the Fourth Street entrance, take the elevator up one flight and turn to the right.

A large attendance and fruit exhibit is assured.

Many representatives from other state societies will be with us as usual and add to the value of the occasion.

Hotel Vendome, 21 South Fourth Street, (between Nicollet and Hennepin Aves.) has, for the third time, been selected as headquarters of visiting members and friends, and special rates secured of 50 to 75 cents per day of one in a room; two in a room for 75 cents to $1.00 per day. One of the best popular priced restaurants in the city is located on the ground floor of this block. Register as "horticulturists," and you will be well treated. A very comfortable and pleasant hotel, with all modern conveniences, only one-half block from our secretary's office and library, in the Kasota Block, and four blocks from the Court-House.

The Minnesota State Forestry Association.

This association will hold a joint session with the Horticultural Society on Thursday afternoon. (See program.) A business session is also announced to be held at 10:00 a. m. Thursday, in some room to be announced at that morning's session of the Horticultural Society. All members are urged to be present. For reduced railroad rates, see paragraph on next page.

TO THE BEE-KEEPERS.

The officers of the Minnesota Bee-Keepers' Association announce that the annual meeting of that society will convene Wednesday and Thursday, December 6 and 7, at the same time and in the same building as the Horticultural Society. Purchase tickets to the Horticultural Society meeting and get the reduced rates.

THE WOMAN'S AUXILIARY TO THE MINNESOTA STATE HORTICULTURAL SOCIETY.

This society will hold its annual session on Thursday at 3:30 p. m., in some room in the building to be announced at that afternoon's session of the Horticultural Society. All ladies interested in horticulture are earnestly invited to be present and connect themselves with this association.

REDUCED RAILROAD RATES.

READ CAREFULLY.

A reduction to one-third railroad fare for the return trip has been secured on condition that *one hundred certificates*, showing that the fare has been paid coming to this meeting, are presented to the railroad agent at Minneapolis. It is certain that this reduction can be secured if *each person attending* obtains such a certificate from the railroad agent at the time of purchasing the ticket. *Do not fail also* to get a similar certificate *at each transfer point* where you have to purchase a ticket on the way to the meeting. The certificate secured with the *last ticket bought* before reaching Minneapolis is the most important and the *only one* that will be counted in the required "one hundred."

N. B.—On reaching Minneapolis turn these certificates over to Secretary Latham at once.

All the railroads in the state south of Minneapolis, also the Great Northern and Northern Pacific railways, offer this reduced fare.

DO NOT FAIL TO GET CERTIFICATES.

Come, *everybody* interested in any branch of horticulture! It is *your* loss if you stay away.

Will the papers of the state please give wide circulation to this notice.

For further particulars, address

W. W. PENDERGAST, President,
Hutchinson.

A. W. LATHAM, Secretary,
207 Kasota Blk., Minneapolis.

PROGRAM.

TUESDAY MORNING SESSION.
10 o'clock.

Invocation, Rev. Walter T. Scott, Morristown.

MUSIC.

Greeting by President W. W. Pendergast.

Appointment of committee on credentials.

General Subject—Plums.

SEVEN FIVE MINUTE PAPERS.

1. Valuable Varieties of Native Plums,
   Martin Penning, Sleepy Eye.
2. New Varieties of Plums, and Methods of Culture Observed in Eastern Europe, Central Asia and Siberia, Prof. N. E. Hansen, Brookings, S. D.
3. Locating, Laying Out and Planting the Plum Orchard, Dewain Cook, Windom.
4. Treatment of the Plum Orchard,
   O. W. Moore, Spring Valley.
5. Harvesting and Marketing the Plum Crop,
   Henry Dunsmoor, Olivia.
6. The Problem of Improving the Native Plum,
   O. M. Lord, Minnesota City.
7. Insects and Diseases Injurious to the Plum,
   Otto Lugger, St. Anthony Park.

Renew your membership or become one by paying the secretary $1.00.

TUESDAY AFTERNOON SESSION.
2 o'clock.

General Subject—Trees and Shrubs.

Report of Committee on Ornamental List,
F. H. Nutter, Minneapolis.
L. R. Moyer, Montevideo.
Fred. Nussbaumer, St. Paul.

Exhibiting Fruit at the State Fair—
From the Judge's Standpoint. Prof. S. B. Green, St. Anthony Pk.
From the Exhibitor's Standpoint. Clarence Wedge, Albert Lea.

NINE FIVE MINUTE PAPERS.

1. Best Varieties of Trees for Street Planting, Wyman Elliot, Minneapolis.
2. Planting and Care of Shade Trees for the Street and Lawn, A. W. Hobart, Supt. of Lakewood Cemetery, Minneapolis.
3. Special Value of Native Trees and Shrubs, Warren H. Manning, Landscape Architect, Boston, Mass.
4. The Growing and Care of Evergreens, B. E. St. John, Fairmont.
5. The Catalpa for Minnesota, J. T. Grimes, Minneapolis.
6. Imported Shrubs Desirable in Our State, R. L. Mackintosh, St. Anthony Park.
7. Locating Shrubs on the Grounds for Effect, F. H. Nutter, Minneapolis.
8. The Practical Value of Tree and Shrub Ornamentation about the Home, W. W. Pendergast, Hutchinson.
9. Some Desirable Things for Prairie Planting, L. R. Moyer, Montevideo.

Facts about the Weather of 1899 in Minnesota of Interest to the Horticulturist, T. S. Outram, Weather Observer, Minneapolis.

Appointment of committees on award of premiums, president's address, obituaries and final resolutions.

WEDNESDAY MORNING SESSION.
9 o'clock.

Short Musical Program.

General Subject—Blackberries.

The following paper is to be read in joint session with the Minnesota Bee-Keepers' Association:

The Pollination of Flowers,
Prof. Conway MacMillan, Minn. State University.

Announce the meeting of Bee-Keepers' Association in Park Commissioners' rooms on the ground floor.

Reports of Local Societies:
Southern Minnesota Hort. Society, Robert Parkhill, Sec'y, Chatfield.
Meadow Vale Hort. Society, A. W. Keays, Secretary, Elk River.
New Ulm Horticultural Club, John Zeller, Secretary, New Ulm.

Reports of Superintendents of Trial Stations:
Prof. S. B. Green, [Central Station.] St. Anthony Park.
E. H. S. Dartt, Owatonna.
Dewain Cook, Windom.
Clarence Wedge, Albert Lea.
Chas. W. Sampson [grapes], Eureka.
O. M. Lord [plums and small fruits], Minnesota City.
H. M. Lyman [apples], Excelsior.
J. S. Harris, La Crescent.
L. R. Moyer, Montevideo.
Mrs. Jennie Stager, Sauk Rapids.
William Somerville, Viola.

EIGHT FIVE MINUTE PAPERS.

1. Profits of Blackberry Culture, W. S. Widmoyer, Dresbach.
2. Varieties of Blackberries Adapted to Minnesota, F. Shadbolt, Caledonia.
3. Planting and Care of the Blackberry Plantation the First Twelve Months, W. P. Rogers, Excelsior.
4. Care of the Blackberry Plantation the Second Year till after Harvest, W. H. Eddy, Howard Lake.
5. Pruning, Fall Cultivation and Winter Protection of the Blackberry, R. A. Wright, Eureka.
6. Harvesting the Blackberry Crop, G. E. Widger, Chatfield.
7. Drawbacks to Success in Blackberry Culture in Minnesota, Thomas Redpath, Long Lake.
8. How the Farmer Grows Blackberries, G. W. Anderson, Minneapolis.

Announce Wednesday afternoon and evening sessions, to be held at College of Agriculture, St. Anthony Park. To reach there, take the Como-Interurban electric car and get off at Dooley ave. Carriages will be in waiting for those preferring to ride the one-half mile to the grounds.

WEDNESDAY AFTERNOON SESSION.
2 o'clock.

To be held in Armory Hall, College of Agriculture, St. Anthony Park. (See above.)

General Subject—The Minnesota Orchard.

Report of Committee on Nomenclature and Catalogue.
J. S. Harris.
Prof. S. B. Green.

TWELVE FIVE MINUTE PAPERS.

1. The Right Way to Plant an Apple Tree, J. C. Kramer, La Crescent.
2-3. The Winter of 1898-1899 in Its Effects on My Orchard. Wm. Somerville, Viola.
E. W. Mayman, Sauk Rapids.
4. Conditions Necessary to the Successful Wintering of a Minnesota Orchard, E. H. S. Dartt, Owatonna.
5. Varieties of Apples Best Adapted to Southwestern Minnesota, C. E. Older, Luverne.
6. The Wealthy Apple, A. W. Latham, Secretary.
7. Apple Culture in the Lake Superior Region of Minnesota, R. L. Pendergast, Duluth.
8. Prospects of Apple Growing in the Red River Valley, Rev. O. A. Th. Solem, Halstad.
9. What Can be Grown Profitably in the Orchard, S. D. Richardson, Winnebago City.
10. Shall the Orchards of Minnesota be Left in Grass? C. Morgan, Forestville.
11. Suggestions from Experience in Locating and Laying Out the Minnesota Orchard, C. W. Merritt, Homer.
12. Topworking a Factor in Increasing the Hardiness of Fruit Trees, Charles G. Patten, Charles City, Ia.

The members in attendance will be entertained at supper by the managment of the College, and have opportunity before the evening session to see something of the school and its equipment and methods.

WEDNESDAY EVENING SESSION.
7:30 o'clock.

To be held at Armory Hall, College of Agriculture, St. Anthony Park.

The program for the evening will consist of vocal and instrumental music and other entertainment by the students of the college.

Two addresses illustrated by stereoptican views:

1. What I Saw in Northern Europe and Siberia, N. E. Hansen, Professor of Horticulture, Brookings, S. D.
2. Agriculture in Europe, W. M. Hays, Professor of Agriculture, Minnesota Experiment Station.

Both these gentlemen have lately visited the countries mentioned.

You can become a life member by payment of $10.00, in two **annual payments of $5.00** each if you prefer. This will entitle **you to a file of our** bound reports, a library in itself.

VISIT OUR LIBRARY

DURING THE MEETING.

207 Kasota Block, Corner 4th Street and Hennepin Ave.

Visit the Society Office and Library. It will be found open and lighted evenings during this meeting. All are welcome.

THURSDAY MORNING SESSION.
9 o'clock.

General Subject—Annual Reports. Vegetables.

President's annual address, W. W. Pendergast, Hutchinson.

Annual report of the executive board, Wyman Elliot, Chairman, Minneapolis.

Annual report of Secretary, A. W. Latham, Minneapolis.

Annual report of treasurer, C. W. Sampson, Eureka.

Annual report of librarian,
(The library is at No. 207 Kasota Block, Minneapolis.)
A. W. Latham, Librarian.
E. A. Cuzner, Assistant Librarian.

(The assistant librarian has charge of the surplus reports stored a Pillsbury Hall, State University.)

Report of legislative committee, Wyman Elliot, Chairman.

Reports of Vice-Presidents,
F. W. Kimball, First Congressional District, Austin.
S. D. Richardson, Second District, Winnebago City.
Mrs. A. A. Kennedy, Third District, Hutchinson.
R. S. Mackintosh, Fourth District, St. Anthony Park
Col. J. H. Stevens, Fifth District, Minneapolis.
Mrs. Jennie Stager, Sixth District, Sauk Rapids.
D. T. Wheaton, Seventh District, Morris.

Hints from Experience in the Vegetable Garden, Prof. Thomas Shaw, St. Anthony Park.

SEVEN FIVE MINUTE PAPERS.

1. Best Kind of Peas and Their Culture, L. P. Lord, Owatonna.
2. The Culture of Beans, G. F. Grannis, Vernon Center.
3. Two Best Kinds of Onions and How to Grow Them, John Zeller, New Ulm.
4. Best Varieties of Turnips and How to Grow Them, Vincent Reeves, Champlin.
5. An Asparagus Bed for Every Home Lot, W. G. Beardsley, Minneapolis.
6. My Family Garden, D. E. Goodman, Faribault.
7. Best Varieties of Sweet Corn and its Culture, J. S. Harris, La Crescent.

THURSDAY AFTERNOON SESSION.
1:30 o'clock.

IN MEMORIAM,
Peter M. Gideon.

MUSIC.

Short Addresses by Messrs. S. B. Green, J. M. Underwood, Col. J. H. Stevens, J. S. Harris, Wyman Elliot, A. J. Philips, J. T. Grimes, S. M. Owen and Pres. Pendergast.

MUSIC.

3:00 Annual Election of Officers.

Announce Annual Session of the Woman's Auxiliary Society in Adjoining Room.

General Subject—Forestry.

(Program under the Auspices of the State Forestry Association.)

1. Forestry Movement in Minnesota, Capt. J. N. Cross, Pres. Minn. State Forestry Association, Minneapolis.
2. Desirability of a Forest Health Resort, J. W. Bell, M. D., Minneapolis.
3. Why We Should Extend Our Forest Reserves, Col. John S. Cooper, Chicago.
4. Forestry Experiments Which Should be Undertaken in Minnesota, Prof. S. B. Green, St. Anthony Park.
5. Our Deforested Areas and Their Probabilities, C. A. Schenck, Ph. D., Biltmore, N. C.
6. What I Saw of Forestry in Europe, Hon. S. M. Owen, Minneapolis.
7. Progress of Forestry in This Country, Gen. C. C. Andrews, Minnesota Chief Fire Warden, St. Paul.

Announce the Report of Committee on Awards.

FRIDAY MORNING SESSION.
9 o'clock.

General Subject—Ornamental Horticulture.

Report of Committee on Fruit List,
Clarence Wedge, Albert Lea.
J. P. Andrews, Faribault.
Prof. S. B. Green, St. Anthony Park.

Report of the Woman's Auxiliary Society,
Mrs. Anna B. Underwood, Secretary Lake City.

Our Poet Friends,
Hon. S. M. Owen, Minneapolis.

SEVEN FIVE MINUTE PAPERS.

1. My Annual Flowers,
Wm. Tomlinson, Hutchinson.
2. Sweet Pea Culture from a Commercial Standpoint,
Mrs. H. K. Eves, Minneapolis.
3. My Hardy Perennial Bed,
S. B. Smith, Foreston.
4. The Construction and Uses of a Plant Window,
D. E. Wagner, Winthrop.
5. How We Conduct Our Flower Show,
Mrs. Ida Thompson, Duluth.
6. Beds of Annuals and Their Arrangement,
Rev. Walter T. Scott, Morristown.
7. The Flower Garden an Index of Character,
Mrs. Frances L. Town, Hewitt.

Nature Study—What is it?
Mrs. Anna B. Underwood, Lake City.

FRIDAY AFTERNOON SESSION.
2 o'clock.

General Subject—Seedling Apples.

Report of Committee on Seedling Fruits,
J. S. Harris, La Crescent.

TEN FIVE MINUTE PAPERS.

1. A Thousand Words on a Thousand Dollar Apple Seedling Premium,
J. M. Underwood, Lake City.
2. Suggestions to Competitors for the One Thousand Dollar Seedling Prize, and Report of the Committee of Award, Prof. S. B. Green, Chairman.
3. How Minnesota Seedlings Have Come Through the Past Winter, J. S. Harris, La Crescent.
4. The Recognition of Valuable Seedlings,
A. K. Bush, Dover.
5, 6, 7. The Art of Growing Apple Seedlings,
Frank Yahnke, Winona.
P. J. Frenn, Burleigh.
Henry Gerdsen, Victoria.
8. The Uses of Apple Seedlings, F. W. Kimball, Austin.
9. The Philosophy of Improving the Apple by Growing Seedlings,
Prof. Wm. Robertson, St. Anthony Park.
10. Seedlings at Wisconsin Trial Station,
A. J. Philips, Secretary, West Salem.

Unfinished Business.
Report of Com. on Obituaries and Final Resolutions.
4:00 P. M.—Two Minute Speeches by the Members.

MUSIC.

4:30 P. M.—Closing Remarks by the President.

PROGRAM
MINNESOTA BEE-KEEPERS' ASSOCIATION.

Eleventh Annual Meeting, to be held at Minneapolis, Minn., in Park Commissioners' rooms in the court-house, Wednesday and Thursday, December 6 and 7, 1899.

OFFICERS.

President, J. P. West, Hastings, Minn.
First Vice-President, Mrs. H. G. Acklin, St. Paul, Minn.
Second Vice-President, Dr. E. K. Jaques, Crystal, Minn.
Third Vice-President, Wm. Russell, Minnehaha Park, Minn.
Secretary, Dr. L. D. Leonard, Minneapolis, Minn.
Treasurer, L. E. Day, Farmington, Minn.

EXECUTIVE COMMITTEE.

H. G. Acklin, St. Paul, Minn. J. A. Howard, Hammond, Minn.
G. S. Perry, Farmington, Minn.

WEDNESDAY MORNING SESSION.
10 o'clock.

The following paper to be read in joint session with the Horticulturists, in their place of meeting.
"Pollination of Flowers,"
Prof. Conway MacMillan of the State University.

Adjournment to Park Commissioners' rooms.

Invocation. Dr. Chas. Bayard Mitchell.
Song, Misses Longfellow.
Reading of the minutes.
Report of the executive committee.
Reports of special committees.
Reports of officers.
Receiving communications and bills.
Admission of new members.
Reading reports by members for 1899, giving:
Number of colonies put into winter quarters, fall 1898.
Number of colonies taken out in spring of 1899.
Number increased in 1899.
Number of pounds comb honey.
Number of pounds extracted honey.
Number of queens sold.
Kind and size of hive used.
Have you foul breed?
Give any information you can.

BEE-KEEPERS' PROGRAM.—Cont.

Opening the question box.

Questions will be answered during the meeting by:
Mrs. H. G. Acklin, St. Paul, Minn.
Dr. E. K. Jaques, Crystal, Minn.
Wm. Russell, Minnehaha Park, Minn.

If so desired, questions can be sent to any of the above in advance of the meeting. After answering, the questions go to the house for discussion.

The Horticulturists have arranged to visit the Experiment Station Wednesday afternoon and evening, and the Bee-Keepers are invited to accompany them. If desired, a room for holding our meetings there will be provided.

WEDNESDAY AFTERNOON SESSION.
1:30 o'clock.

President's Address, J. P. West, Hastings, Minn.

Song, Miss Ethel Acklin, St. Paul, Minn.

"How I Prepare and Winter Bees Outdoors." C. G. Mattson, Lindstrom, Minn.

Piano Solo, Mrs. Frank Hoffman, St. Paul, Minn.

"Off Grades Comb Honey," A. T. McKibben, Morrill, Minn.

"My Method of Producing Comb Honey," Dr. E. K. Jaques, Crystal, Minn.

"The Adulteration of Extracted Honey and How to Prevent it," Hon. Eugene Secor, Forest City, Iowa.

Music. Leonard boys.

"Adulteration of Extracted Honey in Minnesota," J. P. West, Hastings, Minn.

Questions.

Mr. Eugene Secor, General Manager and Treasurer of the United States Bee-Keepers' Association, will be with us at the meeting. A dollar handed to him for membership to the Association will be a dollar well spent, and will be in order at any time.

BEE-KEEPERS' PROGRAM.—Cont.

THURSDAY FORENOON SESSION.
9:00 o'clock.

"How I Manage my Apiary," C. Theilmann, Theilmanton, Minn.

"My Method of Raising Queens," Mrs. H. G. Acklin, St. Paul, Minn.

"How I Produee Extracted Honey," F. C. Erkel, Le Sueur, Minn.

"Cooking with Honey," Miss Moeser, Minneapolis, Minn.

Recitation, Miss Ethel Acklin, St. Paul, Minn.

Questions.

THURSDAY AFTERNOON SESSION.
1:30 o'clock.

Election of officers.

"The Bee or not the Bee, That is the Question," Mrs. Flitner, St. Paul,, Minn.

Music, Miss Grace M. Longfellow.

"A Talk by a Commission Merchant," L. W. Longfellow, Minneapolis, Minn.

A Paper, by Mrs. F. C. Miller, St. Paul, Minn.

"The Budget," Mrs. Mate Williams, Nimrod, Minn.

New business.

Questions.

ADJOURNMENT.

Everybody is invited to be present and take part in the meeting. Before buying tickets see instructions in Horticulturists' program.

The piano used in meeting of Bee-Keepers' Associatiod is furnished through the courtesy of the Metropolitan Music Co., Syndicate Blk.

PREMIUM LIST
Minnesota State Horticultural Society.

All exhibits must be entered with the secretary and in place the first day of the meeting to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The articles exhibited must have been grown in Minnesota or manufactured from Minnesota grown products.

Each exhibit of fruit must consist of four specimens, except when otherwise noted.

No premium will be awarded on unworthy exhibits.

	3d Prem	1st Prem.	2d Prem.
APPLES.			
Collection, not to exceed 10 varieties	$2.00	$6.00	$4.00
Each variety of apples (or crabs) included in the 1899 fruit list of this society or in the 1899 premium list of the Minnesota State Fair (kept in cold storage)		.50	.25
Each variety of apples (or crabs) included in the 1899 fruit list of this society or in the 1899 premium list of the Minnesota State Fair (not kept in cold storage)		.75	.50
Seedling apple, never having received a premium from this society, not kept in cold storage		3.00	2.00
Peck of Wealthy apples, the fruit exhibited to be at the disposal of the meeting,	1.00	3.00	2.00
GRAPES.			
Collection		3.00	2.00
Each variety exhibited included in the fruit list of this society for 1899 or in the 1899 Minnesota State Fair premium list		.75	.50
FLOWERS.			
Collection of ornamental and flowering plants		5.00	3.00
Collection of cut roses		2.00	1.00
Collection of cut carnations		2.00	1.00
Table bouquet		2.00	1.00
Basket of flowers		2.00	1.00
HONEY.			
Collection of comb honey *ad libitum*		5.00	3.00
Collection of extracted honey "		3.00	2.00

Secretary's Corner.

THE SO. MINN. HORT. SOCIETY'S REPRESENTATIVE. Mr. Jonathan Freeman, of Austin, has been appointed the regular delegate from our younger sister as representative at our annual meeting.

DELEGATES FROM THE IOWA SOCIETIES.—Hon. E. Secor, of Forest City, Ia., will be with us at our annual meeting. He represents the Iowa State Horticultural Society. Mr. A. E. Bents, of Cresco, Ia., comes to us from the Northeastern Iowa Society.

DELEGATE TO N. W. IOWA SOCIETY.—Jos. Wood, of Windom, Minn., has consented to represent our society at the annual meeting of the above society, which is to be held at Spencer, Ia,, Dec. 5th to 7th. This is the first occasion in the knowledge of the writer, when we have sent a delegate to that society. Unfortunately, it meets at the same time as we do.

A TRIPLE-JOINT SESSION.—Don't fail to notice that in attending the coming meeting of our society you will meet also the members of two other very practical state societies, the Bee-Keepers and the Forestry Association, which convene in the same building during the same period. We have a right to expect a "warm" time.

DELEGATE FROM THE WISCONSIN SOCIETY.—Mr. Irving Smith, of Green Bay, is to be in attendance at our annual meeting as the representative of the Wisconsin Horticultural Society. Mr. Smith is one of the younger members of their society and is a son of the late J.M. Smith, a veteran of that society, and whom many of our older members had the pleasure of knowing. We shall give his son a cordial welcome.

IN MEMORIAM OF PETER M. GIDEON.—It was our intention to use a portrait of the late Mr. Gideon as frontispiece for the December number, to be accompanied by a biographical sketch, but it has been decided to put them into the January issue instead. This will make his portrait the frontispiece for the bound volume of the 1900 report and will give opportunity to publish in connection therewith the addresses to be given at a memorial service to be held on Thursday afternoon of the annual meeting. (See program,in this number.)

A MONUMENT FOR THE LATE MR. GIDEON.—Various suggestions have come to the writer as to a suitable way in which to recognize the debt of the people to the memory of the originator of the Wealthy apple, for his sturdy perseverance in the development of a pomology for the northwest during a long life time:

1. A suitable monument to be erected over his remains in the cemetery at Excelsior.
3. A tablet to be placed in the Horticultural Hall, nearing completion at the Minn. College of Agriculture.
3. A scholarship in the Minnesota College of Agriculture, to be used in giving a thorough training in horticulture to worthy students. This would require probably $5,000, as only the interest of the fund would be used for this purpose.

This matter should receive consideration soon and is likely to come up at the annual meeting. What is the best plan to pursue in carrying out this purpose to honor our lamented co-laborer?

CORRESPONDING CLIPPINGS.

"Get a collection of wax models for your museum." (We have. Ed.)
PROF. N. E. HANSON, Brookings, S. D.

"I think you are on the right track, and am very much pleased with the Horticulturist." ROBERT WILSON, JR., Glenwood.

"Think you are doing the grandest work next to the spreading of the gospel and the reform of the liquor traffic."
W. T. WARREN, Woodstock.

"I think it is a mistake requiring fruit to be put in place the week before the fair. It takes too much time for those that exhibit in a small way and live at a distance." A. D. LEACH, Excelsior.

"I am greatly interested in reading the reports of the society, and I am greatly benefited thereby. The Horticultural Society is an institution that Minnesota cannot well do without."
S. B. SMITH, Foreston.

"I most heartily endorse the good work of the society, and shall do all in my power to push it along. Our monthly magazine is a real blessing to me. In it I find many 'pointers,' and I study all carefully."
ANDREW I. ENGBRETSEN, Elk River.

"Are there any remedies for plums puffing up, or blighting? Mine were heavily mulched with coarse barnyard manure in the spring before the frost came out, so as to make them later to avoid frost."
CHARLES J. ORTON, Marietta.

"For some years back I have noticed that the red cedar was injured. Within a few days I have noticed that the damage has been done by a small worm. Probably kerosene emulsion or Paris green will destroy it." J. R. CUMMINS, Washburn.

"I purchased 100 seedlings from Mr. Gideon in 1888, nearly all of which have borne fruit; thirty are in bearing this season. I have one tree out of this lot that promises to be a first-class apple, both in tree and in fruit." HENRY DUNSMOOR, Olivia.

"My hobby is our native plums, and also hybridizing the sand-cherry with our native plums. I have a good many seedlings growing and three fruited this year; two of them are larger than the Compass (cherry.)" JOSEPH WOOD, Windom.

"Out of a few orchards planted about thirty years ago, where the trees had no care, what do I find now? The only survivals are Siberain crabs, not only living but bearing annually. I think they ought to be recommended for planting by the society."
J. S. JERABEK, Silver Lake.

"The only damage on my place from last winter was to a few hundred seedling apples on high ground, and to some of my Domestica plums. It is of no use for any man to bother to raise the Domestica plum. It is all right in Japan, but it is not at home here. Our best native plums are the only ones that give fruit and profit."
CHARLES LEUDLOFF, Cologne.

"I am spending the summer in the northern part of Todd county and find the people, especially the old settlers, very indifferent on the subject of fruit growing. When I offer them my magazines they refuse to read them, saying they cannot raise fruit up here, and

that they have been swindled enough by nurserymen, which is too true. But I am not defeated and shall not surrender."

FRANCES L. TOWN, Hewitt.

"I have put out an orchard of 160 trees, on account of attending the horticultural meeting last winter. I think nurserymen ought to get trees to the planter in better condition, as many were dry and dead that came to this neigborhood. This discourages the planter and others who would try them. We think there is no society in the state run with as much profit to the state as the Horticultural Society."

WM. TOMLINSON, Hutchinson.

"I am thinking better of the Philips' seedlings. The Avista blights some, but not so bad as it gets older. I think in a favorable place it would do pretty well, and the apple is a good keeper. I have some in my cellar now (July 8, 1899) that are sound and good, and that without extra care. The sweet apple, which I suppose is the Eureka, is also a good keeper, and the tree has no bad faults. If I were planting a new orchard, I would plant a good many of them."

SIDNEY CORP, Hammond.

"I would recommend the planting of none but the hardiest varieties, and then top-work tender ones onto them. I would not do this all in one year, but in three or four, and even then leave some of the orchard stock. I would not use one kind but a number of kinds on the same tree. I have thirty varieties of young apple trees. Tender varieties worked on Virginia crab, with Duchess and Hibernal on the same tree, came through the winter in good order, while young root-grafts killed to the ground." JENS A. JENSON, Rose Creek.

"I would recommend all fruit growers to weed out all trees that summer-blight and dig out all that winter-kill. About forty-five years ago I read a discussion of Wisconsin horticulturists upon the merits and demerits of the Ben Davis apple. It was considered hardy by a very small majority. Now, what I would like to impress upon tree planters is, where the hardiness of a tree is questioned to leave it out of the list. I had a fine Ben Davis tree, fifteen years old, a beautiful tree. It bore one crop and then 'kicked the bucket'."

JOHN C. WALKER, Rose Creek.

"I commenced here on the wild prairie thirty-five years ago to open a farm with my naked hands, and at the same time and up to this time tried to demonstrate that *some* fruit could be raised in Minnesota, all in the face of the earnest advice and best judgment of my friends that apples, at least, could not be raised in this state and surely not on the open prairie. Of course, it was uphill work the first twenty years—but I persisted in planting seeds and root-grafts until I have actually raised apples. Last season (1898) I exhibited at our county fair 233 varieties of apples, and this last June had forty varieties keeping well in our warm farm house cellar and had a few varieties still the first day of August. This season our crop is very light—had to pick close to get 163 varieties to exhibit and very few to sell. I furnished the seed in 1852 that raised the old Wolf River tree and have the oldest Wolf River trees in the world, now that the old tree is dead. I have hundreds of wild plums growing and believe we should, as a people, raise more plums and have been lately setting all the grafted kinds. J. S. PARKS, Pleasant Mounds.

Annual Meeting.

December 6-9, 1898.

JOURNAL OF THE THIRTY-SECOND ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, HELD IN MINNEAPOLIS.

(For program of this meeting see page 474, Report of 1898.)

TUESDAY MORNING SESSION.

The meeting was called to order by President J. M. Underwood, at 10 o'clock A. M., in the rooms of the County Commissioners of Hennepin County.

The President: Fellow members, Ladies and Gentlemen. The time has arrived for the opening of our morning session. Without stopping to make any further opening remarks, we will at once take up our program for this forenoon. We have a very interesting topic. The general subject is "Strawberries." A number have spoken to me and desire that this program shall be carried out in detail, and it will therefore be necessary to start promptly and stick strictly to the subject in order to give each paper that consideration which its importance demands.

In taking up the work of this meeting I want you to understand that we want a full and free discussion of all topics, and we want every one who is present in the room, whether a member of the society or not, to be at perfect liberty in taking part in the discussions or in asking questions, and generally assist in making the program interesting, and if in any way we can help you in the consideration of the topic under discussion, of course, we shall be glad to do so. We want promptness. I believe it is the most interesting program that has ever been put before the society for consideration

The first business in hand is the appointment of a committee on credentials. I will appoint C. L. Smith, S. D. Richardson and Dewain Cook. All delegates present from other societies will please leave their credentials with the secretary.

The following paper was then read: "The Old Favorites among Strawberries." C. A. Sargent, Red Wing. (See index.)

Discussion.

The President: Touching on this matter of new varieties, our next paper will probably throw some light on that subject.

"The Valuable New Varieties of Strawberries." W. S. Widmoyer, Dresbach. (See index.)

Discussion.

"Methods of Planting Strawberries Compared." N. C. Ernst, Dodge Center. (See index.)

Discussion.

At this juncture the president read a telegram of greeting and congratulation from the Indiana State Horticultural Society then in session.

On motion of Mr. C. L. Smith, the secretary was instructed to return greetings and best wishes of the Minnesota Society.

"My Method of Keeping Accounts With Berry Pickers." A. G. Long, Excelsior. (See index.)

Discussion.

Mr. T. T. Smith, chairman of the committee on credentials, reported the following delegates entitled to seats in the convention: Mr. J. S. Hartwell, president of the Northern Illinois Horticultural Society and delegate from the Illinois State Society; Mr. C. F. Gardner, from the Northeast Iowa Society, and Prof. N. E. Hansen, from the South Dakota Society.

The President: *Ladies and Gentlemen:* Let me introduce to you Mr. Hartwell, of the Illinois society. We are glad to have Mr. Hartwell with us, and hope he will make himself as useful as possible.

Mr. J. S. Hartwell: *Mr. President, Ladies and Gentlemen:* I hope the society will not think I am going to take up as much time as I have already taken up this morning. This is a subject that is very near my heart. In discussing this subject I have possibly done too much talking already. I assure you it is very pleasant for me to get up in the Arctic regions and see people growing berries on icebergs. I am surprised to see you people exhibit so much enthusiasm and energy in your work, and have no doubt that therein lies the secret of your success.

The President: I take pleasure in introducing to you Prof. Hansen, of the Brookings (South Dakota) College.

Prof. N. E. Hansen: Our South Dakota society has been in a state of suspended animation, not dead, but sleeping, but it is not owing to the interest of the members, but to the financial condition. It has not been helped by the state, as you may have heard, but we hope to get some aid this winter so we can

publish the annual report. We got together at the state fair and talked over affairs, and we concluded to have a meeting at Yankton, and we hope you will send a delegate to our meeting there. I sent Mr. Underwood and Mr. Latham programs, and I hope as many of you as can will come. I am glad to meet with you, and I feel that it always pays me well to come over here.

The President: I will now introduce to you Mr. C. F. Gardner, representing the state society of Iowa. We shall be very glad to hear any word of cheer in regard to horticultural interests.

Mr. C. F. Gardner: *Mr. President, Ladies and Gentlemen:* I am very glad to be with you, and always feel at home when attending your meetings. I have been a member of your society for several years, and have taken a life membership, and I feel at home when I am here with you, as you all know. I will state that so far as horticultural matters in our state are concerned, I think we are progressing and doing the best we can. I hope and expect that some of you will be present at our annual meeting, which is to be held next week at Des Moines. I will not take up any more of your time, except to again express my pleasure at meeting with you.

"The Art of Originating New Varieties of Strawberries." C. F. Gardner, Osage, Ia. (See index.)

Discussion.

"How to Get the Largest Crop of Strawberries with the Least Labor." John Eklof, Stockholm. (See index.)

Discussion.

The meeting then adjourned until 2 P. M.

TUESDAY AFTERNOON SESSION.

The President: The general subject for this afternoon is "Shelter Belts and Screens." This is a very important and interesting subject, and I trust you will get out of it all there is in it.

"The Place of Evergreens and Deciduous Trees in the Shelter Belt." C. L. Smith, Minneapolis. (See index.)

Discussion.

"The Location of Shelter Belts and Their Uses and Value." Geo. W. Strand, Taylor's Falls. (See index.)

"Best Varieties of Evergreens for the Shelter Belt." S. D. Richardson, Winnebago City. (See index.)

Discussion.

"The Economic Value of Shelter Belts about the Home." Hon. S. M. Owen, Minneapolis. (See index.)

Discussion.

"The Fruit Garden with and without the Shelter Belt." Prof. W. W. Pendergast, Hutchinson. (See index.)

"Shelter Belts for Both Timber and Prairie." Prof. W. M. Hays, St. Anthony Park. (See index.)

"Hints from Experience in Growing Shelter Belts." C. B. Clark, Minneapolis. (See index)

Discussion.

"How to Secure a Deciduous Tree Belt." T. A. Hoverstad, Crookston. (See index.)

"The Shelter Belt as a Factor in Stock Growing." O. C. Gregg, Lynd.

Discussion.

The president then appointed the following committees: Awards on flowers, Mrs. Jennie Stager; apples, Mr. C. F. Gardner; grapes, A. D. Leach.

Committee on president's address: T. T. Smith, Dewain Cook and R. A. Wright.

Final resolutions: Clarence Wedge, D. T. Wheaton and C. B. Clark.

Obituary: A. K. Bush, J. C. Hawkins and H. M. Lyman.

The meeting then adjourned until 9 o'clock Wednesday morning.

WEDNESDAY MORNING SESSION.

The meeting was called to order by the president at 9:30 o'clock.

The President: We have a long and interesting program this forenoon, and we want you to be prompt in asking and answering questions and bringing out the points of interest in the various topics. We are glad to have so many ladies with us this morning, and we want them to feel perfectly free to join in the discussion of the papers, and help to make the program as interesting as it is possible to make it.

Reports from local societies were then submitted and ordered filed for publication without reading. (See index.)

Mr. J. C. Hawkins: Mr. President, I would like to introduce a resolution at this time in regard to our constitution if it

is not out of order. I will read the article in our constitution as it now stands, and then I will read the proposed change.

After reading Article III. in the constitution, referring to membership of local and auxiliary societies, Mr. Hawkins read the following resolution as a proposed amendment:

RESOLUTION TO AMEND THE CONSTITUTION.

Resolved, That Article III, of the constitution be amended by striking out the words: "Secretary of this society a properly certified list of its members, an annual report of its proceedings, and an annual fee of seventy-five cents for each member of such local society where the membership numbers from ten to twenty-five, or fifty cents for each member where the membership is more than twenty-five," and by inserting in their place the words: "annual meeting of this society a duly authorized delegate, and shall transmit to the secretary a properly certified list of its members, an annual report of its proceedings, together with the papers read at its meetings, and an annual fee of twenty-five cents for each member of such local society."

The President: This proposition is to change the fee required from seventy-five cents in one case and fifty cents in the other to a straight fee of twenty-five cents in all cases. That is the substance of the resolution, and the requirements of the constitution are that this resolution must be presented two days before it is acted upon. It will therefore lie over until Friday morning.

Dr. Mary Whetstone: I would like to inquire if that applies only to horticultural societies?

The President: I think that is all that the constitution contemplates.

Mr. Elliot: I presume Dr. Whetstone refers to some other organizations in our state that are not purely horticultural, but are working along special lines, and it is a question whether or not they could become members of this society. For instance, we have a very enterprising mushroom club in our city, and they would like to come in and join us.

The President: Could not that society come in as a horticultural society?

Dr. Whetstone: It is certainly a fruit, a fruit of the fungi. We would be glad to come in with you and become interested in your work, and you would become interested in ours.

The President: We would certainly feel very much honored by having your society become associated with our organization, either in the regular way by paying a dollar for membership or coming in as a society.

The Secretary: The constitution says "any local society," it does not say any horticultural society.

Mr. Philips, (Wis.): What does it cost to join your mushroom society?

Dr. Whetstone: One dollar.

Mr. Philips: I thought it didn't cost anything, and then you could get into this society for twenty-five cents. (Laughter.)

Mr. Harris: In order to avoid future complications I would suggest that you change that to read "local horticultural societies." I think Mr. Hawkins had better add that to his proposed amendment.

The Secretary: How would it do to put in "members of any local society whose membership fee is not less than one dollar?"

Mr. Hawkins: I think that would be all right. I will accept those suggestions.

Dr. Whetstone: Do I understand by the motion that members of a local society can become members by the payment of twenty-five cents?

The Secretary: It includes the whole membership as a body.

Mr. Hawkins: If this amendment should carry, one of the provisions is that each local society shall be represented by a regularly authorized delegate, and all papers that are read shall be published and disseminated throughout the state.

Dr. Whetstone: We shall be represented, as a member of our club will read a paper before you tomorrow afternoon.

The President: I am requested to call attention at this time to the amendment of Article III, of our constitution as proposed at our last annual meeting, which I will ask the secretary to read.

Secretary Latham then read the following amendment of Article III, of the constitution:

PROPOSED AMENDMENT TO THE CONSTITUTION.

Amend Article III, of the constitution by adding the words: "No member shall vote at any election of officers except those who have been members for not less than two consecutive years immediately preceding that in which the election is being held."

On motion of Mr. Wedge a rising vote was ordered.

A rising vote being taken, thirty votes were cast in favor and two against the proposed amendment, and it was declared adopted.

"Report of Committee on Fruit List." Clarence Wedge, Chairman. (See index.)

"Best Variety of Currants for the Amateur Grower." J. R. Cummins, Washburn. (See index.)

Discussion.

"Most Profitable Sorts of Currants for the Market Gardener." Wm. Lyons, Minneapolis. (See index.)

Discussion.

"Planting and Care of Currants for the Market Gardener." Frank Yahnke, Winona. (See index.)

Discussion.

"Planting and Cultivation of the Currant for the Amateur." A. D. Leach, Excelsior. (See index.)

"Profits of Currant Culture." W. H. Brimhall, Hamline. (See index.)

"Insects that Ravage the Currant and Gooseberry." Prof. O. Lugger, St. Anthony Park. (See index.)

Discussion.

The meeting was then declared adjourned untill 2 o'clock.

WEDNESDAY AFTERNOON SESSION.

The meeting was opened at 2 o'clock by the president.

The first topic on the program was the report of the Joint Russian Apple Nomenclature Commission. (See index.)

Discussion.

On motion of C. L. Smith, the report of the commission was accepted.

Wyman Elliot: I would make a motion to adopt the report now.

Mr. Elliot's motion to adopt the report being put to a vote was unanimously carried.

"The Owatonna Experiment Station at Short Range." Wyman Elliot, Minneapolis. (See index.)

"Report on Owatonna Experiment Station." J. S. Harris, La Crescent. (See index.)

"Planting the Blackcap Raspberry Field." Dewain Cook, Windom. (See index.)

Discussion.

An intermission of ten minutes was then taken, during which Mr. Theodore Nagel regaled the audience with a baritone solo, entitled "Two Grenadiers," which was roundly applauded.

"Report of Owatonna Experiment Station." E. H. S. Dartt, Superintendent. (See index.)

"Treatment of the Blackcap Raspberry Field during Harvest." R. A. Wright, Eureka. (See index.)

Discussion.

"Profits of Growing the Red and Blackcap Raspberries Compared." C. W. Sampson, Eureka. (See index.)

The President: We have two gentlemen with us as delegates from sister societies whom we have not noticed in a public way. We are very glad to have them with us. I want to call on Mr. Patten, who is here as a representative of the Northeastern Iowa Society.

Mr. Patten, (Iowa.): Mr. President I have appeared before you so much that I shall not occupy your time very much. I will say that I am glad, as I always have been, to meet with the Minnesota Horticultural Society. I have been present at your meetings for quite a number of years, and I am very much pleased to see the increasing numbers as the years go along. I believe you have the most rapidly growing horticultural society of any I know of in this western country. We used to pride ourselves in Iowa on having a very live horticultural society, and we have now, but so far as the ability to attract members are concerned you are going far ahead of us. I congratulate you on the work you have accomplished in the past few years. I remember when I came here there was only a handful, using a common expression, and I am very much pleased at the great interest manifested and the rapid growth of your society and the remarkable growth of horticultural sentiment in your state. The northern third of Iowa is very much like the southern third of Minnesota—very much so indeed. What we can grow there you can reasonably expect to grow here with, perhaps, some modifications. You have some advantages over Iowa; you have more rolling land than we have in Iowa and a better apple soil. I am pleased to meet with you and to note your wonderful progress. I will not occupy your time any longer. (Applause.)

The President: We have another delegate from Iowa from whom we would be pleased to hear a few words. I refer to Mr. Elmer Reeves of Iowa.

Mr. Elmer Reeves: *Mr. President, Ladies and Gentlemen:* I am not much of a hand at making speeches, so I will take very little of your time.

I am glad to be with you. It is nine years since I was with you last. I am pleased to note the growth of your society, and I agree with my neighbor, Mr. Patten, that you have one of the most wideawake, *the* most wideawake society of any I know anything about. I think we have good societies in Iowa; we have four district societies and one state society. There are other local societies, but those I have mentioned cover our territory fully. I remarked to a gentleman today that the further north you go the more energetic the people appear to be. It is a matter of interest to look over the fruit

exhibit. I remember at one of our state meetings a few years ago, I think it was 1886 or 1887, we were very much discouraged as to apples. One man got up and held up two fingers as representing the number of varieties of apples we could raise in northern Iowa. Now we have not enough fingers on both hands to represent the number we can raise. That was just a few years ago comparatively, and I see you are keeping pace with us as to varieties. I am anxious to learn as to some new winter varieties, the same as you are also, and the experiments that are now under way cannot but result in finding varieties that will be of great value, long keeping apples of quality.

I am also interested in other lines of fruit growing, raspberries, currants and so on. I appreciated very much the discussion on currants and currant growing that was had this forenoon. I think your plan of arranging the program is very satisfactory. You take up one topic and dispose of it thoroughly, and then take up another and treat it in the same way. I believe your plan is to take up a subject one year and discuss it along lines that have not been discussed the previous year, and so after a few annual meetings you cover the ground quite thoroughly.

I want to say again. that I am very glad to be with you and hope to profit by my visit. (Applause.)

The President: I would say that we are equally well pleased to have you with us, as also the other delegates who have already been presented to the society. We like the spirit you show in attending our meetings. You come here feeling that you are here to take part with us in our deliberations and discussions of the different subjects that come up. We want you to feel perfectly at home, and if you do not get all you want or are not treated right let me know, and I will have it corrected.

Mr. Dartt: There is one thing about the gentleman's speech that causes us to like him, or rather both of them. We like them because they feed us taffy. (Laughter.) That point that people become more energetic as you go north is a good one; of course, that applies to our case exactly—but we must look out in such matters, because there is a limit. You know there are Eskimos north of us. (Renewed laughter.)

Mr. Reeves: It would not do for me to repeat the taffy Mr. Dartt gave us when he was in Iowa. (Great laughter.)

Prof. Hansen then entertained the audience with an interesting account of his recent trip to Russia and Siberia.

The meeting adjourned until 9 o'clock Thursday morning.

THURSDAY MORNING SESSION.

To insure an auspicious opening of the day, upon urgent request "Finnegan's Wake" was sung by President Underwood, which was followed by an original poem, by Mr. Dartt.

President's Annual Address. J. M. Underwood, Lake City. (See index.)

On motion of J. S. Harris, the president's address was referred to the committee for its consideration.

Mr. Harris: I would also request Mr. Underwood to furnish a copy of his address to the country newspapers for publication. In that way it will be read by people who would otherwise not read the address.

"Annual Report of Executive Board." Wyman Elliot, Chairman. (See index.)

"Annual Report of Secretary." A. W. Latham, Minneapolis. (See index.)

"Annual Report of Treasurer." C. W. Sampson, Eureka. (See index.)

On motion of Mr. C. L. Smith, the reports of the secretary and treasurer were adopted.

"Annual Report of Librarian." (See index.)

On motion of Mr. Elliot, the report of the librarian was accepted and ordered placed on file for publication.

"Cultivation of Squash in the Family Garden." J. S. Jerabek, Silver Lake. (See index.)

Discussion.

"Selection of Varieties for the Vegetable Garden." J. E. Northrup, Minneapolis. (See index.)

"The Farmer's Vegetable Garden." A. K. Bush, Dover. (See index.)

Discussion.

THURSDAY AFTERNOON SESSION.

The meeting was called to order at 2 o'clock by the President, and the unfinished program of the morning was taken up.

"Potatoes in the Market Garden." Franklin De Cou, St. Paul. (See index.)

"Melons for Market." H. C. Ellergodt, Lanesboro. (See index.)

"What Kinds of Potatoes Have Proved Most Valuable?" J. C. Walker, Rose Creek. (See index.)

Discussion.

"The Melon Peach and its Possibilities." Mrs. A. G. Long, Excelsior. See index.)

Discussion.

"Report of Committee on President's Address." T. T. Smith, Chairman. (See index.)

Discussion.

Upon motion of Mr. Harris the report was unanimously adopted.

"Report of Committee on Ornamental List." L. R. Moyer, Montevideo.

L. R. Moyer: The committee has no report to make except the one they made last year. They would recommend the republication of that list.

ELECTION OF OFFICERS.

On motion of Mr Elliot, nominations for the office of president were declared in order.

During the time of the election of the president, Mr. Harris assumed the chair.

Mr. Elliot: Mr. Chairman, I wish to place in nomination for the office of president of this association a man who will reflect honor and credit on the society and on the state, a man whom you all know and in whom you have the fullest confidence, and whose ability and enthusiasm you all recognize in working for the best interests of horticulture. I might spend a good deal of time in eulogizing his fitness for the position, but I have not the necessary time, and it would be useless, because you all appreciate the value of the man and his fitness for the position when I name him. In placing his name in nomination I do it with a feeling of responsibility, because I know that we need a president of this society around whom we can all rally as a standard bearer, and in whom we can have confidence, and one that you all know will do everything that is possible to be done to encourage the work and increase the value of this association.

It affords me great pleasure to place in nomination the name of Prof. W. W. Pendergast as president of this society for the ensuing year. (Enthusiastic applause.)

Messrs. Dewain Cook and R. A. Wright were appointed tellers, and a ballot was taken with the following result: Total number of votes cast, sixty-four; of which Prof. Pendergast received sixty and Mr. Underwood four.

On motion of Mr. Underwood, the election of Prof. Pendergast was made unanimous.

The President: I take pleasure in presenting to you your president-elect, Prof. Pendergast. (Applause.)

Remarks by Prof. W. W. Pendergast. (See index.)

Additional officers were then elected as follows: Treasurer, C. W. Sampson, Eureka; vice-presidents, 1st congressional district, F. W. Kimball, Austin; 2d congressional district, S. D. Richardson, Winnebago City; 3d congressional district, Mrs. A. A. Kennedy, Hutchinson; 4th congressional district, R. S. Mackintosh, Langdon; 5th congressional district, Col. John H. Stevens, Minneapolis; 6th congressional district, Mrs. Jennie Stager, Sauk Centre; 7th congressional district, D. T. Wheaton, Morris.

"The Work of an Improvement Club." Miss Lucia E. Danforth, Sec'y Women's Auxiliary. (See index.)

THURSDAY AFTERNOON SESSION.

"Report of the Women's Auxiliary of the Minn. State Hort. Society." Miss E. V. White, Pres. (See index.)

"Town and Village Improvement." Mrs. Anna B. Underwood. (See index.)

On motion of Sec'y Latham, the president was instructed to appoint a committee of five to visit Col. J. H. Stevens and convey to him the greetings of the society.

The committee appointed consisted of Messrs. Wyman Elliot, A. K. Bush, Jno. T. Grimes, J. S. Harris and W. L Parker, to which were added visiting delegates from other states.

"My Success with Garden Flowers." Mrs. C. O. VanCleve, Minneapolis. (See index.)

"Report of Minneapolis Mycological Society." W. M. Babcock, Minneapolis. (See index.)

"What Flowers Shall We Plant about the Home?" Mrs. L. A. Danforth, Red Wing. (See index.)

"The Plant Window in Winter." Mrs. O. C. Gregg, Lynd. (See index.)

"Shade Trees for Ornament about the Home." L. R. Moyer, Montevideo. (See index.)

"Native Plants for Ornamental Purposes." Prof. D. Lange, St. Paul. (See index.)

Discussion.

FRIDAY MORNING SESSION.

"The More Recent Minnesota Apple Seedlings of Value." J. S. Harris, La Crescent. (See index.)

Discussion.

Mr. Peter M. Gideon, of Excelsior, having just entered the room, on motion of Mr. Philips, as a mark of respect and esteem, the audience rose to receive him, and an intermission of ten minutes was taken in order to give those present an opportunity to greet him. (His last visit to the society prior to his death.)

"Legal Protection for the Originator of a Seedling Fruit." A. B. Choate, Minneapolis. (See index.)

Discussion.

"The Peerless and its History." Geo. R. Miller, Richland. (See index.)

"Apple Seedlings of Merit in Northern Iowa." Clarence Wedge, Albert Lea. (See index.)

"Does Experience Promise Minnesota a Hardy, Long-Keeping Seedling Apple?" E. H. S. Dartt, Owatonna.

On motion of Mr. Harris a return was made to the original name of the apple introduced by Mr. Patten, viz.: Patten's Greening.

On motion of Mr. Elliot the naming of the long-keeping apple originated by Mr. Ditus Day was referred to the committee on nomenclature.

Mr. Hartwell, (Ill.): There are no words I can find to express my appreciation of the pleasure I can get out of this meeting as an Illinoisan. I have been trying to solve the problem of your enthusiasm ever since I have been here, and I think I got hold of it today. I have been pumping your president for an explanation of the cause. The explanation is, friends, you have got something to work for specifically; you have set your mark at a point you are striving to reach, and you are going at it in a systematic way to reach it, and you are going to get there. It is apparent in this morning's meeting that you are imbued with the spirit of enthusiasm and progress, and that you are not yet ready to sit down and rest satisfied with your attainments. Our people are also enthusiastic, but they do not see how it is possible to develop anything beyond what we have done in the past, but I hope to carry enough enthusiasm back to stir up Illinois. The methodical discussion of this question of cions, the development of the apple orchard, and the discussion of seedlings it seems to me points to the fact that you have got right hold of the thing, and there is no reason for your having the least apathy on that question.

I want to thank you for the many courtesies I have received at the hands of the society, and I want to invite you to attend our meetings

in Illinois, and especially the state meeting at Springfield the 27-29th of December. (Applause).

The meeting then adjourned until 1:30 p. m.

FRIDAY AFTERNOON SESSION.

The meeting was called to order at 1:30 by the president.

Mr. J. C. Hawkins called up the resolution offered by him at a previous session regulating the entrance fee of auxiliary societies to the state society, and moved its adoption.

Mr. Hawkins: You will notice that in the proposed amendment we make it obligatory on an auxiliary organization to be represented here by regularly authorized delegates. Under the present rule we are not required to do that. Any one can come here or not as they see fit. We are not represented here officially or regularly, but under the proposed change we would be represented. It also provides that all the papers and reports shall be transmitted to the secretary for publication. Now in regard to the matter of money. I started out with this matter in hand two years ago in our Southern Minnesota society, and as an inducement for members to join the society, I said: "Join this society and pay your dollar and get the benefit of the reports, then we will keep twenty-five cents of it and the other seventy five goes to the state society." I was met with this argument, and it is the hardest to meet: "There are no horticulturists that are not taxpayers, and these reports are published at the state's expense, consequently we are entitled to them." I told them that was a narrow view to take, but it was broad enough to be entitled to consideration. Then there is another point, the smaller the membership the more is required of them. My experience with those auxiliary societies throughout the country is that twenty members is more than an average for each society, and if I were to make any difference in the amount to be paid I would require more from the larger society than from the smaller, because if you take seventy-five cents from the smaller, or where they have not more than twenty members, they will not have enough to pay for their programs. Our society is the strongest in the state, and last year we ran up to about one hundred, and, as the president knows, we had a large and enthusiastic meeting. I put lots of work into it, as did others also, and we had a successful meeting, but at the same time some of us had to go down into our pockets to foot the bills. I do not want to cut loose from the state society, we want to make both societies stronger and more progressive, and I trust you will see that this can be done by the amendment proposed.

The motion to adopt the amendment referred to being put to a vote, unanimously prevailed.

"Wisconsin Seedling Apples of Value in Minnesota." A. J. Philips, West Salem, Wis. (See index.)

"The Legislature versus the Tree Shark." H. M. Benton, Minneapolis. (See index.)

Discussion.

Sec'y Latham: I want to present this resolution at this time in regard to the San José scale bill; this may bring out some questions that Mr. Benton can answer.

"Resolved, That the president appoint a committee of five to draft a bill to present to the state legislature which shall prevent the introduction and spread of the San José scale or any other parasitic insect or any noxious disease within the state."

After a long and spirited discussion the resolution was amended to read as follows:

"Resolved, That the president appoint a committee of five to draft a bill to present to the state legislature to regulate the introduction and sale of nursery stock within the state."

In this form the resolution was unanimously adopted.

"The Prospective Value of Northwestern Apple Seedlings." Edson Gaylord, Nora Springs, Ia. (See index.)

Mr. Reeves, (Ia.): I must take the train in a few minutes and I want to bid you good bye. I thank you for the hearty reception you accorded me in my visit with you, and I want to invite you all to our Iowa meeting, where we shall try to make you welcome.

"Fall Planting of the Orchard." J. P. Andrews, Faribault. (See index.)

"The Duchess Apple in Minnesota and How to Handle it." E. H. S. Dartt, Owatonna. (See index.)

Discussion.

"Top-Working the Minnesota Orchard." D. F. Akin, Farmington. (See index.)

"My Selection of Varieties in an Orchard of 1,000 trees." Wyman Elliot, Minneapolis. (See index.)

Discussion.

The president appointed the following committee under the resolution adopted providing for the appointment of a committee to draft a bill looking to the regulation of the introduction and sale of nursery stock: Messrs. Wyman Elliot, J. Cole Doughty, A. K. Bush, Clarence Wedge and S. B. Green.

The President: I can hardly refrain from expressing my appreciation to the Minnesota State Horticultural Society for the very hearty support they have given me as president of this society during the past six years, and it is not without a feeling of lonesomeness and, perhaps, of regret in a measure that I take my leave from

the chair as president of this society. At the same time I feel as though it were for the interest of the society, and I have no doubt it will be for me, as it will give me an opportunity to sit as an ordinary member and take part in the deliberations, which is an opportunity I have not had in the past six years. I would say to every member of the society that is here or absent, that you have always given me your most hearty and cordial support, and I wish to thank you from the bottom of my heart for all the kindness you have shown me, and I shall continue to work with you for the best interests of the society.

On motion of Secretary Latham the delegates and visitors from societies in adjoining states were made honorary members for the ensuing year.

Mr. Barnes, (Wis.): I wish to express our thanks for the kindness and courtesy that has been shown us by the members of this society. It has afforded me great pleasure, indeed, to meet with you and become acquainted with you, as I never had the pleasure of meeting with you before, and this is my first visit to this portion of your state. I hope it will not be the last time I may be able to meet with you, and I hope to become a life member before I die. I want to extend to you a cordial invitation to visit our societies in Wisconsin at any time when the meetings may be held.

Mr. A. F. Brayton: I have just returned from an eight thousand mile journey. I have been through British Columbia, Washington, Oregon and California, through Old Mexico, New Mexico, Texas and Oklahoma. I have lived in Minneapolis forty years, and I want to say to you we ought to be thankful we are not living on the Pacific coast, as fruit there is no comparison in flavor with anything we have here. Mr. Elliot spoke about the way they preserved their apples there. He is right; in Santa Cruz they put them in piles and never barrel them up at all. I spent two months in Los Angeles, and they fed me on the biggest strawberries I ever saw, without any flavor, and I decided that Minnesota, Iowa, Wisconsin and Illinois were the best places on earth to live. (Applause.)

Mr. J. S. Harris, as chairman of the committee on obituaries, presented the following report: (See index.)

Secretary Latham introduced the following resolution:

Resolved, That the Minnesota State Horticultural Society heartily endorses the efforts of the Board of Regents to increase the facilities for instruction in horticulture and forestry at the School of Agriculture, and hereby urges the coming legislature to make an appropiation of $35,000 for constructing and equipping a building for horticulture, forestry, botany and physics.

The Secretary: This resolution has to do with a prime necessity at the state farm school. We made an effort two

years ago to secure an appropriation for a building for botany and horticulture, but failed. This resolution embodies the action of the board of regents. Our society is very much interested looking towards the advancement of that school in the art we love.

Mr. C. L. Smith: Let me say right here this is for horticulture and forestry, and it is for the interest of the people of the state of Minnesota, and I want to appeal to the country members of the society to work with their members of the legislature for the passage of this bill. You can rest assured that the members of the legislature from the twin cities will be in favor of it if we can get the country members interested. I have no doubt but that the whole legislative delegation from Minneapolis and St. Paul are in favor of the bill, but those we have got to interest are the members from the country districts, and those of you who are here please interest your members in this matter.

On motion of Mr. Harris the resolution was unanimously adopted.

Mr. E. W. Randall introduced the following resolution:

"Resolved, That this society express its appreciation of the interest of Mr. J. W. Thomas, of Minneapolis, in horticulture, as manifested by his donation of $100 in cash prizes for fruit at the recent state fair."

On motion of Mr. Harris the resolution was unanimously adopted.

Mr. Clarence Wedge, in behalf of the committee of final resolutions, submitted the following report:

Resolved, That the particular thanks of the society are due to our retiring president who has so ably and industriously served us for the past six years. We feel that a large share of the prosperity which we now enjoy is due to his persistent efforts to make our meeting enjoyable and our work useful, and it is with sentiments of real regret that we have felt compelled to accept his decision to lay down the gavel.

Resolved, That the thanks of the society be extended to the county commissioners of Hennepin county for the use of rooms so well adapted to our meeting.

Resolved, That our thanks be given to Howard, Farwell & Co. for the use of their piano.

Resolved, That we extend to Harrison & Smith, the public printers, our appreciation of their prompt and efficient work in printing our magazine and annual reports, and for their courtesy and confidence in continuing our publications in the absence of an appropriation by the state.

Resolved, That we thank the visiting delegates for their presence, counsel and assistance.

Resolved, That we heartily thank Mr. Lane, the superintendent of the court-house, the janitors of the same and the musicians who have so kindly added to the enjoyment of the occasion.

CLARENCE WEDGE,
D. T. WHEATON,
C. B. CLARK,

Committee.

On motion of Mr. C. L. Smith, the report of the committee was unanimously adopted.

Mr. Harris: We all feel that the sentiment contained in the words of that resolution is correct. Our president has served us well, has put in his time and energy to make this society progress, and we have progressed, and I am glad that the sentiment of the society is expressed in the unanimous adoption of that resolution.

Mr. Dartt: The gentleman intimated that the president made the society. I think he should have added the secretary, too. Without them the society cannot thrive. (Applause.)

The President: I want to say to the members of the horticultural society that I hope you fully appreciate the importance of the office of the secretary of this organization. I am sure I do. If I have been able to accomplish any valuable results in the building up of this society it has been through the aid of our efficient secretary, and I want you to appreciate the importance of that office and the fact that in the efficient work he has done it was my greatest pleasure in serving you as president to sustain him and hold up his hands in carrying out the duties which he had to perform. And I want you to appreciate the importance of the office of secretary and assist him in the future as you have in the past with your hearty co-operation.

The meeting was then declared adjourned till 7:30 p. m.

FRIDAY EVENING SESSION.

The program of this session was furnished by the School of Agriculture and consisted of music by the school orchestra and band, and papers by the students. There were also interesting exercises with dumb bells and indian clubs and a mandolin solo by Mr. Merrill.

Remarks by Col. W. M. Liggett, Dean of the School of Agriculture:

Mr. President, Ladies and Gentlemen:

In July, 1897, the Association of American Agricultural Colleges and Experiment Stations held its eleventh annual meeting in Minneapolis. Their place of meeting was at the university, and they were in session there during three days. The fourth day was spent at the agricultural college and experiment station examining our plans, learning our methods of teaching and inspecting our experiments made at the station. When we invited these 148 representatives from different states, who were engaged in this same work, we anticipated we would take them somewhat by surprise. While they had heard much of our plans and methods of work in our convention and at previous ones, I was satisfied that at all those meetings they had taken a great many of our statements with a good deal of allowance. They inspected our work, found out all they could of our methods of teaching, asked questions upon various subjects we are teaching and our plan of teaching and, more particularly, how we secured all the students in attendance. That was a great surprise. As you know, a great many universities are carrying on agricultural education upon a similar plan, and they are doing good work, but there are few universities that are doing anything but elementary work—and I may say there is no other institution in the United States that is doing the same work we are doing. Many thought this elementary work was all that we were doing and that we were using the fund that was appropriated for that purpose. When they found out what we were doing in three years of elementary work and four years of university work, then they were surprised. They were very much surprised, indeed, expecting Minnesota was about to take the lead in that line of education, and it gave them something to talk about.

It was my pleasure to attend the twelfth annual convention in Washington, and I could understand what had surprised them. The greeting I received was very complimentary, and from the questions they asked I knew they were well pleased with what we were doing, and I believe I have a just right to feel proud

I may say, Mr. President, that the fact of my attendance on that convention is perhaps the reason why I have not been in attendance at the meetings of the horticultural society here. I found myself buried in work on my return, and I have had to put in twelve full hours daily trying to catch up. I have learned something of your meetings, however, and it is my loss that I have not been able to be present. I must congratulate you, members of the Horticultural Society of Minnesota, for what you are doing, and thank you for the reception you have given the School of Agriculture. It is the proper thing to do, and for that reason I want to congratulate you. It is the means of making your society stronger than it is. It is a pleasure to note your constant increase, your membership numbering some 800, making it the strongest organization of its kind in the country. You have invited the students of the college of agriculture to come here this evening and occupy the entire evening session, and I want to say that it is a great pleasure and compliment to them,

and it is most helpful to you. You bring these students in touch with your work, and they have an interest in you.

We hope to have you with us next summer at your annual meeting, as usual. We will ask you to make that your home, and we will anticipate your meeting with a great deal of pleasure.

I want to thank you again in behalf of the School of Agriculture for this very kind invitation and the privilege of occupying this evening. (Applause.)

Reponse. President J. M. Underwood.

Col. Liggett, and Students of the School of Agriculture:

I want to express on behalf of the State Horticultural Society our appreciation of the privilege of having you with us tonight. I have looked to this School of Agriculture as a means of great good that is to be done to the cause of horticulture in this state, and in my annual address to the society on Thursday I mentioned the fact that I looked upon the school as one of the sources from which a great good was to come to the State Horticultural Society, and I feel an interest in it when I think of the great reforms that come through education. Here is an organization second to none, perhaps without an equal in the United States of its kind; I hear it disputed only by some people who live in other states, because they think they have something as good as anybody else, and we cannot blame them. I will let you draw your own conclusions and let them think as they please, but I still think there is nothing in the United States that compares with our School of Agriculture. (Applause.) So I think the horticultural society is to be congratulated in having this strong ally that is coming forward to aid in its future work. The young men and women of the school are certainly enjoying a great privilege. I have watched the work of this school from the beginning, and I have appreciated the fact that many things in my own experience that it has taken years of time to acquire a knowledge of you are able to acquire in a few years. You have the advantage of learning in this school what we had to learn by experience. It has been a tough lesson for us, and I doubt if you ever have a lesson as hard in your experience as we have had. I think as the days and months go by you will appreciate that fact. On the side I have had a little cream through my association with the dairy interests of the state, but in the field of horticulture I find the associations and work which give me the greatest pleasure and claim my deepest interest, and I want to ask all of you that so far as possible you will bring to the State Horticultural Society of Minnesota all the aid that lies in your power, and you will find that you are engaged in a good work and that you are traveling in excellent company. There are none of them that drink, and I do not think any of them swear, they do not use tobacco, and altogether they are a mighty good set of people. (Laughter and applause.) I think you will be pleased to associate with them and take part in their deliberations, and as you grow up with the state I hope you will never leave, and that you will all become enthusiastic members of the State Horticultural Society. (Prolonged applause.)

PROGRAM.

"Evaporation From Dormant Trees." S. O. Tuve, Appleton. (See index,)

"Cultivating and Having Home Grown Fruits." Miss M. Rowe, Wells.

"A Little of Everything in Small Fruits." Mr. Cutting, Byron. (See index.)

"Something about the Trees near my Home." Miss M. Denison, Faribault. (See index.)

"A Summer in a Garden." Mr. L. Cady, Buffalo. (See index.)

"Strawberries." R. Hoadlund, Wayzata. (See index.)

The regular program was concluded with the "lantern show" by Prof. S. B. Green, a display of interesting pictures he had taken of scenes in the pines and of the homes and faces of our friends, etc. Appropriate descriptions of the various pictures accompanied them. It was a fitting conclusion of a most happy occasion.

On motion of Secretary Latham, Mr. J. C. Kramer, of La Crescent, was made an honorary life member of the society.

Being called upon, Mrs. Meredith, the preceptress at the School of Agriculture, responded:

Mr. President: I want to congratulate this horticultural society on their courage. While Mr. Allard was going through the indian club exercise it did not strike me as very strange what he was doing, but what impressed me most forcibly was that the people sitting over there appeared to have no fear. Think of the consequences if he had let one of those clubs fly. (Laughter.)

In regard to our school of young ladies, I want to say only this, we have this kind of a time all the time, and if you come over there you will get a share of it. (Laughter and applause.)

Adjourned *sine die.*

RECORD OF MEETINGS OF EXECUTIVE BOARD FOR 1899.

Dec. 5, 1898. Office of the Secretary, 8 p. m.

All the members were present except Mr. L. R. Moyer. The account of the treasurer for the fiscal year,1898,showing balance on hand of $320.98, was examined and duly approved. The secretary's account for the period from June 25, 1898, to date, was audited and approved. $422.47.

The secretary was authorized to procure a sufficient number of Wernicke bookcases to equip the office, and a sufficient amount was appropriated to meet the expense.

An appropriation was made of $100 to be used in the purchase of dies and the manufacture of medals to be used in connection with the exhibits of the society, and Messrs. J. M. Underwood, Clarence Wedge and A. W. Latham were appointed to have charge of the expenditure.

Adjourned *sine die.*

WYMAN ELLIOT, Chairman of Executive Board.
A. W. LATHAM, Secretary.

Dec. 9, 1898. Record of Meeting held at the Court-House, Minneapolis, 6 p. m.

All the members were in attendance. Mr. Wyman Elliot was elected chairman of the board for the year 1899.

A. W. Latham was elected secretary of the society for the ensuing year at a salary of $800.

The salary of the president was fixed at $25, and that of the treasurer at $25.

The standing committees for the year 1899 were appointed, the list being the same as for the preceding year.

The bill for premiums paid at the annual meeting, 1898, was audited and allowed as follows:

A. W. Latham, Secretary..... $132.50

The following delegates were elected to represent the society:

J. M. Underwood, to Wisconsin; C. E. Older, to South Dakota; R. H. L. Jewett, to Iowa; R. L. Mackintosh, to Illinois.

It was decided to recommend to the society the name of J. C. Kramer as an honorary life member.

In conformity with the action of the society, a committee was appointed to have in charge the awarding of a premium of $1,000 for a seedling apple tree "as hardy and prolific as the Duchess, with fruit equal to the Wealthy in size, quality and appearance and that will keep as well as the Malinda." The following were appointed on this committee: J. M. Underwood, W. W. Pendergast, S. B. Green and A. W. Latham, and they were instructed to prepare rules governing the competition and award.

Adjourned *sine die*.

WYMAN ELLIOT, Chairman of Executive Board.
A. W. LATHAM, Secretary.

June 21, 1899. Record of Meeting held at the Secretary's office, in Minneapolis.

The following members were present: Wyman Elliot, Chairman, W. W. Pendergast, J. S. Harris, S. B. Green, J. P. Andrews, L. R. Moyer and A. W. Latham.

The secretary's bill for expenses of the society, from Dec. 5, 1898, to date, was audited and allowed:

A. W. Latham, secretary..... $1,116.49

It was decided to recommend to the summer meeting of the society the name of Chas. A. Duncan, of Duluth, as a member of the State Forestry Board.

Adjourned *sine die*

WYMAN ELLIOT, Chairman of Executive Board.
A. W. LATHAM, Secretary.

Sept. 7, 1899. Report of Meeting held at the State Fair Grounds, Horticultural Building.

Present: Wyman Elliot, chairman, W. W. Pendergast, J. S Harris, S. B. Green and A. W. Latham.

The regulations pertaining to the award of $1,000.00 for an apple seedling were adopted, and the following permanent committee on award appointed;

Prof. S. B. Green, chairman, J. M. Underwood, J. S. Harris, Clarence Wedge and A. K. Bush.

It was decided to hold the next annual meeting in Minneapolis, and Messrs. Elliot, Green and Latham were instructed to prepare the program therefor.

Adjourned *sine die*.

WYMAN ELLIOT, Chairman of Executive Board.
A. W. LATHAM, Secretary.

LIST OF MEMBERS, 1899.

Annual Members.

Anderson, G. W. . 3114 Girard ave. S., Mpls.
Anderson, N. W. . 3114 Girard ave. S., Mpls.
Anderson, Nils . . . . . Lake City
Anderson, Erik . . . . . Lake Park
Andrews, J. P . . . . . Faribault
Akin, D. F . . . . . Farmington
Anderson, A . . . . . Wolverton
Amundson, A. A . . . . . Kirkhoven
Arneson, A. C . . . . . Foston
Aschenbeck, J. H . . . 731 4th ave. N., Mpls.
Austin, L. E . . . . . Glencoe
Anderson, Adolph . . . . . Renville
Anderson, Mons . . . . . Lanesboro
Allen, L. W . . . . . Spring Valley
Adams, N. W . . . . . Winnebago City
Anderson, E. F . . . . . New Canada
Abbott, C. A . . . . . Saratoga
Anderson, M. D., J. D.,
32 Syndicate Block, Mpls.
Anderson, Hans Geo . . . . . Norseland
Alin, Alex . . . . . Fullerton, N. D.
Aultfather, C. F . . . . . Austin
Archibal, A. H . . . . . Big Lake
Andrews, Gen. C. C.,
833 Goodrich ave., St. Paul
Allert, J . . . . . Deephaven
Becker, J. C . . . . . Adrian
Bontecou, W. W . . . . . Spring Valley
Booth, D. T . . . . . Willmar
Buss, O. E . . . . . Edgerton
Brewster, Prof. H. W . . . St. Anthony Park
Bull, H. P . . . . . Brownsdale
Brimhall, Wm. H . . . . . Hamline
Bussee, H. L. F . . . . . Station A, Mpls.
Benjamin, R. G . . . . . Hutchinson
Bennett, Richard . . . . . Montrose
Bickerdike, R. N . . . . . Balsam Lake, Wis.
Bunnell, M. C . . . . . Newport
Bowers, D. M . . . . . Howard Lake
Bost, A. A . . . . . Excelsior
Beckley, J . . . . . Nerstrand
Bass, J. G . . . . . Hamline
Baillif, R. L . . . . . Bloomington
Bush, A. K . . . . . Dover
Burtzlaff, Paul . . . . . Stillwater
Barclay, J. M . . . . . Madison Lake
Broman, Aug . . . . . Atwater
Buck, Daniel . . . . . Mankato
Broberg, T. O . . . . . Waconia
Blethen, C. E . . . . . Walnut Grove
Bragestad, J. N . . . Box 648, Decorah, Iowa
Bedford, S. A . . . . . Brandon, Manitoba
Benton, H. W . . . . . 302 N. Y. Life, Mpls.
Bisbee, John . . . . . Madelia
Blair, C. L . . . . . Clyde
Birkett, N . . . . . Ellsworth
Bieletski, Alex . . . . . East Chain Lakes
Brunsdale, K. H . . . . . Hatten, N. D.
Brewer, I. C . . . . . St. Charles
Buttermore, R. H . . . . . Lake City
Boelk, F . . . . . Lansing
Brownell, J. R . . . . . Racine
Bradley, W . . . . . Washington
Bacheller, T. T . . . . . Box 594, Mpls.
Belden, C. D . . . . . Austin
Baker, H. G . . . . . Austin
Baccock, A. L . . . . . Grogan
Brooks, S. G . . . . . Lake Crystal
Brown, C. H . . . . . Vernon Center
Bergquist, C. O . . . . . Willmar
Berthalson, C . . . . . Albert Lea
Bright, A. F . . . . . Mazeppa
Bollum, M. J . . . . . Bell Chester
Bollum, B. J . . . . . Belvidere Mills
Beckrich, Nich . . . . . Shakopee
Blom, O. H . . . . . Hagen
Bailey, Chester . . . . . Elk River
Bookwalter, S . . . Chamber of Com., Mpls.
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Barber, Theo . . . . . Etter
Birkholz, A. H . . . . . Howard Lake
Bremer, Geo . . . . . Cannon Falls
Bang, Olof . . . . . Hoyt
Bunt, Wm. S . . . . . Ipswich, Wis.
Bull, James A . . . . . Edina Mills
Bull, J. H . . . . . Edina Mills
Broughton, A. L . . 511 4th ave., S. E., Mpls.
Barnard, Mrs. M. M . 805 7th st., S. E., Mpls.
Boutelle, F. E . . . . . Northfield
Busch, Fred . . . Lyndale S. & 50th st., Mpls.
Bullen, C. H . . . . . Ashton, S. D.
Butler, W . . . . . Fairhaven
Baldwin, J. H . . . . . Fairhaven
Block, Frank . . . . . Maine Prairie
Barton, Mrs. Isabella . . . . . Excelsior
Brayton, A. F . . . . 511 Nicollet ave., Mpls.
Baker, A. F . . . . . Britt, Iowa
Cash, W. H. H . . . . . New Lisbon, Wis.
Charlson, S . . . . . Sogn
Cashman, Thos. E . . . . . Owatonna
Conner, C. W . . . . . Sac City, Iowa
Christianson, Peter . . . . . Hutchinson
Carr, J. A . . . . . 83 Western ave, Mpls.
Crane, H. L . . . . . Excelsior
Cook, Dewain . . . . . Windom
Crockett, E. D . . . . . 35 W. 33d st., Mpls.
Cook, Mrs. Louisa . . . . . Hutchinson
Crooker, Mrs. E. B . 2212 Oakland ave., Mpls.
Carroll, R. C . . . . . St. Anthony Park
Cummins, Osborn . . . . . Eden Prairie
Cross, Mrs. E . . . . . Sauk Rapids
Cuzuer, E. A., Essex and 27th ave. S. E., Mpls.
Cuzner, Mrs. E. A.,
Essex and 27th ave. S. E., Mpls.
Cook, F. L . . . . . Spearfish, S. D.
Comee, S. S . . . . . Waseca
Chadderdon, Chas . . . . . Windom
Clemens, L. A . . . . . Storm Lake, Iowa
Cutting, Fred E . . . . . Byron
Choate, A. B . . . . 410 Temple Court, Mpls.
Cooper, Edward . . . . . Adrian
Carlson, Frank . . . . . Dunnell
Cummins, Mrs. J. R . . . . . Washburn
Currie, Hugh . . . . . Clyde
Cary, L. N . . . . . Mandan, N. D.
Condy, Geo. H . . . . . Cooperstown, N. D.
Clasen, Jos . . . . . Loretto
Crane, F . . . . . New Ulm
Campbell, A. C.,
320 W. 10th st., Fremont, Neb.
Crawford, M . . . . . Cuyahoga Falls, Ohio
Clark, Dr. E. F . . . . . Eureka
Cheely, C . . . . . Morrill
Clausen, H. R . . . . . Evan
Christensen, Bertel . . . . . Albert Lea

Colby, R . . . . . Goodhue
Cleland, C. R . . . . . Dundas
Chapman, R. W . . . . . Plainview
Cutler, M . . . . . Princeton
Coleman, Isaac . . . . . Maine Prairie
Capes, Geo . . . . . Fair Haven
Cannon, J. M . . . . . Celia, Neb.
Dartt, Harvey S . . . . . Owatonna
Doolittle, C. J . . . . . Evansville, Wis.
Davidson & Co., C. M.,
112 E. Front st., Cincinnati, O,
Dahle, S. K . . . . . Brownsdale
Delamater, D. P . . . . . Edina Mills
Davis, Francis . . . . . Goodhue
DeCou, Franklin . . . . . St. Paul
Dresden, Alfred . . . . . Tenhassen
Drake, G. W. M . . . . . Monticello
Dike, C. C . . . . . White Bear Lake
Deters, D. H . . . . . Eitzen
Dunsmore, Henry . . . . . Olivia
Dodds, J. E . . . . . Wheaton
Davis, John O . . . . . Goodhue
Dahle, G. A . . . . . Brownsdale
Eklof, John . . . . . Stockholm
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Eddy, P. E . . . . . Howard Lake
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Ensberg, S . . . . . Toronto, S. D.
Engen, O. O . . . . . Bergen
Erickson, G. R . . . . . Goodhue
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Engleson, F. J . . . . . Hagen
Eaton, Chas . . . . . Elk River
Engbretsen, A. J . . . . . Elk River
Ericson, Peter . . . . . Box 100, Elk River
Endon, Jas . . . . . Godahl
Frederickson, S. C . . . . . Cobden
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Fitzer, Chas . . 1329 Fremont ave. N., Mpls.
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Ferguson, Wm . . . . . Chatfield
Friton, Otto . . . . . Sleepy Eye
Facey, M. V . . . . . Preston
Frankland, Thos . . . . . Stonewall, Man.
Failing, Eugene . . . . . Lake City
Flatin, G. F . . . . . Spring Grove
Fryer, F. E . . . . . Frankford
French, A. J . . . . . Austin
Freeman, Jonathan . . . . . Austin
Freeman, Isaac . . . . . Spring Valley
Fuller, F. A . . . . . Park Rapids
Featherstone, Thos . . . . . Red Wing
Featherstone, S. T . . . . . Red Wing
Furber, J. T . . . . . Madelia
Fleming, Albert . . . . . Garden City
Fraley, G. P . . . . . Annandale
Fouts, W. A . . . . . Mo. Valley, Iowa
Gunderson, Ole . . . . . Tordenskjold
Goodman, D. E . . . . . Faribault
Guiteau, K. N . . . . 163 Nina ave., St. Paul
Green, J. B . . . . . Brooklyn Center
Grassman, Chas . . . . . Morris
Green, Prof. S. B . . . . . St. Anthony Park
Grimes, Calvin . . . . . Northfield
Grannis, G. F . . . . . Vernon Center
Gergen, N. B . . . . . Hastings
Gibson, Thos . . 603 Board of Trade, Duluth
Garden, Miss Lillie . . . . . Nordness, Iowa
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Grant, J. F . . . . . Windom
Gastfield, A. F . . . . 2212 W. 2d st., Duluth
Guerdsen, Henry . . . . . Victoria
Greig, Robt . . . . . Pine City
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Goff, Prof. E. S . . . . . Madison, Wis.
Gress, G. M . . . . . Sleepy Eye
Gould, J . . . . . Fair Haven
Guptill, Gill . . . . . Maine Prairie
Gurney, C. W . . . . . Yankton, S. D.
Heins, P. W . . . . . Olivia
Hacklander, A . . . . . Blue Earth City
Haseltine, E. W . . . . . Grand Forks, N. D.
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Humes, Elmer . . . . . Pleasant Grove
Helm, J. L . . . . . Capitol, St. Paul
Howard, J. A . . . . . Hammond
Hunter, C. C . . . . . St. Anthony Park
Hays, Prof. W. M . . . . . St. Anthony Park
Hinckley, C. N . . . . . Champlin
Hamlin, Alonzo . . . . . Spring Valley
Heath, Edgar A . . . . Guaranty Loan, Mpls.
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Hegg, G. A . . . . . Box 466, Decorah, Iowa
Hagen, Ole J . . . . . Hendrum
Hinds, H. W . . . . . Parker, S. D.
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Hill, Lafayette . . . . . Chatfield
Hall, D. S . . . . . 2509 Colfax S., Mpls.
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Hawkinson, Chas . . 907 15th ave. S., Mpls.
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Hector, A . . . . . Worthington
Hall, Francis . . . . . Etna
Highby, L. P . . . . . Albert Lea
Hadland, O. P . . . . . Ostrander
Helvig, John J . . . . . North Star
Heine, G. W . . . . . Washington
Hotson, A . . . . . Lyle
Hyland, P . . . . . Farmington
Hyland, J . . . . . Farmington
Hesselgrave, R. V . . . . . Winnebago City
Hallowell, Rev. C. T . . . . . Park Rapids
Hayes, W. H . . . . 619 9th ave. S. E., Mpls.
Heath, Rufus . . . . . Elk River,
Higbee, W. S . . . . . Washburn
Hendrix, Dr. G. A . . 1210 Guar. Loan, Mpls.
Hayter, Mrs. J. G . . . . . Annandale
Hites, Geo . . . . . South Haven
Hicks, E. G . . . . . Maine Prairie
Haywood, W. L . . . . . Maine Prairie
Hansen, John . . . . . Kimball
Hoskins, Wilkin . . . . . Maine Prairie
Hoskins, Eli . . . . . Maine Prairie
Johnson, Gust . . . . . 2425 8½ st., Mpls.
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Jaques, E. K . . . . . Crystal
Jewett, R. H. L . . . . . Capitol, St. Paul
Jewett, E. G . . . . . 546 Selby ave., St. Paul
Johnson, R. A . . . . . Hanley Falls
Johnson, Ingval . . . . . Wahpeton, N. D.
Jensen, J. A . . . . . Rose Creek
Jackman, A. C . . . . . Petersburg
Jenson, Robt . . . . . Bixby
Johnson, Geo. B . . . . . Clay Bank
Johnson, C. R . . . . . Clay Bank
Julian, Aug . . . . . 2105 W. 1st st., Duluth
Johnson, J. A . . . . . Box 23, Elk River
Johnson, R. B . . . . . Blue Earth City
Jensen, H. C . . . . . Kingston
Johnson, Ed . . . . . Gardner, N. D.
Johnson, R. Alex . . . . . Hanley Falls
Katzner, Rev. J. B . . . . . Collegeville
Keller, Theo . . . . . Woodstock
King, R. Solon . . . . . Welcome
Kennedy, J. W . . . . . Lake City
Kaer, N. C . . . . . 2211 24th ave. S., Mpls.
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Kording, John . . . . . Hayfield
Kingsbury, Mrs. D. L.,
1996 Milwaukee ave., Merriam Park
Kenney, S. H . . . . . Morristown
Kearns, W. F . . . . . Austin

Kelly, J. P. . . . . Biddeford, Me.
Kenyon, J. E. . . . . Lamberton
Klobstad, T. A. . . . . Milan
Klevann, P. P. . . . . Starbuck
Kilbourne, F. M. . . . . Lakeville
Kately, W. H. . . . . Sherburne
Knapheide, R. . . . 500 St. Peter st., St. Paul
Koren, J. D. . . . . N. P. R'y Co., St. Paul
Krueger, W. R. . . . . Homer
Keasling, Fred. . . . . Elk River
Keays, A. W. . . . . Elk River
Knauss, J. C. . . . . Morristown
Kimball, F. W. . . . . Austin
Kennedy, Mrs, Jennie V. . . . . Kimball
Klein, Jacob. . . . . Hokah
Kerstiens, Moritz. . . . . St. Augusta
Kennedy, S. A. . . . . Lake City
Lord, O. M. . . . . Minnesota City
Laird, John C. . . . . Winona
Leisen, Wm. . . . . Sauk Center
Leonard, E. A. . . . . Racine
Latto, John. . . . . LaCrescent
Leach, A. D. . . . . Excelsior
Lewis, B. N. . . . . 3447 9th ave. S., Mpls.
Lyons, Wm. . . . . 2924 Clinton ave., Mpls.
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Lyman, J. H. . . . . Eagle Lake
Longbittern, John. . . . . Redwood Falls
Lucken, K. J. . . . . Portland, N. D.
Loftus, A. J. . . . . Farmington
Larson, L. H. . . . . Cottonwood
Luke, Fred K,
Botanical Hall, O. S. V., Columbus, Ohio
Lord, L. P. . . . . Owatonna
Leigh, Chas. . . . . Fairmont
Lomen, O. O. . . . . Decorah, Iowa
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Leonard, S. F. . . . . Washington
Livingstone, R. C. . . . . Spring Valley
Lietz, L. . . . . Dover
Lawrence, C. J. . . . . Sundown
Logan, James. . . . . Platteville, Wis.
Lyman, A. B. . . . . Excelsior
Lightly, T. J. . . . . Chatfield
Lind, Herman. . . . . Aldrich
Lawson, F. E. . . . . Goodhue
Lenzmeir, Henry. . . . . Shakopee
Lawrence, A. . . . . Winthrop
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Peter M. Gideon, Excelsior, Minn.,
October 27, 1899.
J. C. Plumb, Milton, Wis.,
March 19, 1899.

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